The Cotton Gin and Oil Mill

PRESS

MARCH 22, 1958

59th year

THE MAGAZINE OF THE COTTON GINNING AND OILSEED PROCESSING INDUSTRIES

A PROGRESSIVE AND RESPONSIBLE PUBLICATION

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THE COTTON GIN AND OIL MILL PRESS

THE COTTON GIN AND OIL MILL PRESS...
READ BY COTTON GINNERS, COTTONSEED CRUSHERS AND OTHER OILSEED PROCESSORS FROM CALIFORNIA TO THE CAROLINAS

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OFFICIAL MAGAZINE OF:
NATIONAL COTTONSEED PRODUCTS ASSOCIATION
NATIONAL COTTON GINNERS' ASSOCIATION
ALABAMA COTTON GINNERS' ASSOCIATION
ARIZONA GINNERS' ASSOCIATION
ARKANSAS-MISSOURI GINNERS' ASSOCIATION
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TENNESSEE COTTON GINNERS' ASSOCIATION
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THE COTTON GIN AND OIL MILL PRESS
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OUR COVER PICTURE:

Heavy equipment is being used to break the hard pan in the scene on our cover. Soil compaction is one of the topics discussed in the special material in this issue, which features the Western Cotton Production Conference. The Conference was held March 4-5 at El Paso, Texas, under the sponsorship of the Southwest Five-State Cotton Growers' Association and the National Cotton Council.

Photo, Courtesy Caterpillar Tractor Co.

DIXISTEEL®
SIDE-OPENING BUCKLE

THE BUCKLE WITH ALL THESE FEATURES

- Easy on the hands
- Strong on the tie
- Good throat, easy threading
- Guaranteed proof strength of 3,000 lbs.
- Breaking strength up to 6,000 lbs.
- Made from new-billet steel
- Tumbled to eliminate sharp edges
- Lies flat to band; minimizes friction against other metals in boxcars—believed a cause of cotton fires
- Shipped in cotton bags within each lift of cotton ties

Now available with Dixisteel ties

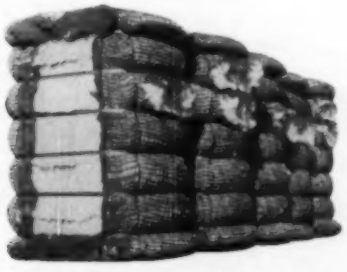
Ginners, compressors, and shippers alike will welcome this new DIXISTEEL Side-Opening Buckle, now available with the favorite of all cotton ties—DIXISTEEL.

They are cold punched from hot-rolled special analysis, new-billet steel, and tumbled to provide a smooth finish. There are no sharp edges to cut ties, hands, or gloves.

DIXISTEEL Buckles consistently run 15% higher in strength than ASTM standards. They will not snap at the eye, spread, bend or break.

These new buckles are packed in cotton bags, 300 to each bag. Five 50-lb. bags are *packed inside* of each lift of 50 bundles of cotton ties.

Specify DIXISTEEL Cotton Ties with the new side-opening DIXISTEEL Buckles.



DIXISTEEL COTTON TIES

Standard bundles weigh approximately 45 pounds and contain 30 ties—each 15/16 inches by approximately 19 gauge, 11½ feet long. Sixty-pound ties are also made. Buckles available separately in any quantity.

DIXISTEEL® COTTON TIES AND BUCKLES

made only by

Atlantic Steel Company

ATLANTA, GEORGIA

Why seed treaters prefer new Du Pont Ceresan® liquids

"We like 'Ceresan' 100 because it colors uniformly, doesn't settle out. It also does away with the corrosion problem and has an agreeable odor. We've used 'Ceresan' products for 13 years with complete farmer satisfaction."

—Jack Reimer, Owner-Mgr.
Reimer Seed Co., Medford, Oklahoma

" 'Ceresan' liquids have excellent handling qualities—are more agreeable to use. They give good uniform color, and there's no dusting off when bagging or drilling. Our farmers know 'Ceresan' means effective disease control."

—T. P. Sutton, Owner-Mgr.
Olustee Farm Supply, Olustee, Oklahoma

"Treated cottonseed with new 'Ceresan' 100. Found it unusually pleasant to work with. It gives greater economy, better results, and seed is given a strong, uniform coloring. Consumers really accept 'Ceresan', making selling easier."

—P. S. Stovall, Vice-Pres. & Gen'l. Mgr.
Hollandale Seed & Delinting Co., Inc.
Hollandale, Miss.

"'Ceresan' 200 works very well in our treater. Irritation and odor are minimized, and there's no corrosion. It gives seed much better color and control of mold in the germinator than other products."

—H. S. Stowe
Lider Gin Corp., Plainview, Texas

"We prefer 'Ceresan' liquid to any of the many seed-treating materials we have tried. Our help prefer it because of its safety and lack of disagreeable odor. It colors seed better and is economical to use."

—Ernest B. Johnston, Gen'l. Mgr.
Centrala Farmers Cooperative, Inc.
Selma, Alabama

"We are very well satisfied with the way 'Ceresan' 200 fits our operation and with its handling qualities. The operators report it's easier to work with from the standpoint of no dust, no odor and in loading the equipment."

—W. E. Ashcraft, Mgr.
Ashcraft Gin & Mill Co., Monroe, N. C.

Seed treaters everywhere prefer new Du Pont "Ceresan" liquids because of their superior handling qualities and exceptional control of disease organisms. These new liquids help speed up seed treating, don't settle out . . . and there's no objectionable odor or dust problem. They give you superior economy and longer equipment life because corrosion is held to a minimum.

No matter what type equipment you use—liquid, slurry, mist or converted dust treater—there's a "Ceresan" liquid designed for it. Buy and try a "Ceresan" liquid mercurial seed disinfectant today!

Du Pont advertising helps bring customers to you

This spring, leading farm magazines with a circulation of over five and three-quarter million will carry Du Pont advertisements featuring your seed-treating services. Growers will be told of the important service you perform when you treat their seed with Du Pont "Ceresan" liquids.

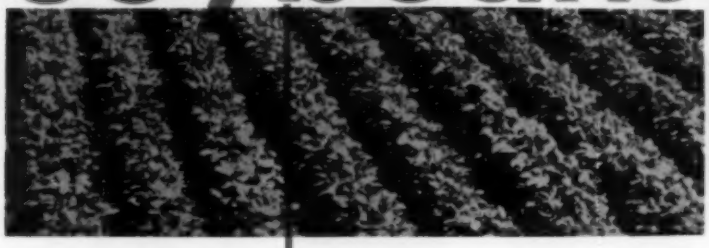
On all chemicals, follow label instructions and warnings carefully.

DU PONT
REG. U.S. PAT. OFF.
Better Things for Better Living
. . . through Chemistry

CERESAN®
Seed Disinfectants

Your "Magic Key" to Bigger, Better Crops!

How to Make Soybeans Pay



Recommendations of Experiment Stations and experienced growers will help to make soybeans profitable in the Southeast, Midsouth, and West.

SOYBEANS are making money for many farmers in Cotton States. They are helping these farms, also, by improving crop rotations, increasing yields of other crops and making better use of land, labor and equipment. Soybeans offer many advantages to farmers of the South, not the least of which is the ready market that is available for them at oil mills from the Carolinas to California.

Soybeans will do well on many farms where they are not grown now. Farmers who have had experience with the crop, Experiment Station research workers, Extension Service leaders, and representatives of industry who have studied the crop agree on this. They are convinced that carefully-planned trials of soybeans will result in many farmers getting a "new" crop and a better cropping system.

Practices which experience and research have proved to be best on most farms in Cotton States are outlined in this article. It is compiled from data supplied by many authorities. These include research and extension workers of USDA and land-grant colleges, the field staff of the National Cottonseed Products Association Research and Educational Division (who have made a comprehensive soybean survey), Dr. Harold D. Loden of Paymaster Farms, (a leader in soybean development in West Texas), and many others.

Any farmer interested in a new crop will do well to study this information. It will give him a sound basis for trying soybeans on his own farm. The article should, of course, be supplemented by authoritative local information, available from County Agents, Experiment Stations, Vocational Agriculture Teachers, cotton oil mills and, especially, from other farmers experienced in growing soybeans.

• **Soils**—Soybeans will grow on a wide variety of different soils, but do best on fertile, well-drained loams. Seedbed preparation and drainage present greater problems on the heavier soils. Western growers should watch to prevent development of a high salt or boron content in their soils. As a rule, however, most growers should not have difficulty in fitting soybeans into the soil types on their farms.

• **Rotations and Double-Cropping**—Soybeans offer farmers many advantages in addition to the revenue they produce. They are helping producers in the older Cotton Belt, High Plains area of West Texas and California develop better crop rotations.

Soybeans also have enabled farmers in many areas to double-crop their farmland. They have done well following Irish potatoes and vegetable crops in some areas, and after small grains in others. There may be still other combinations, yet undiscovered, that will help farmers make better use of their land.

When double-cropping, farmers should be sure that there is enough moisture for soybeans after a small grain, potato or some other crop. Also, be sure that there is adequate labor and equipment to handle soybeans and other crops. Soybean yields often are somewhat lower following another crop, but the grain from two crops in one season more than offsets the drop in soybean yield.

Better crop rotations are especially important—as in the cotton-sorghum area of the Southwest. Many High Plains growers have materially increased their yields of cotton and grain sorghums by using soybeans in their rotations. They urge producers to consider soybeans, not solely on their own yield and net income return, but as a part of the entire cropping system.

• **Inoculation and Seed Treatment**—Dr. E. E. Hartwig, head of USDA's regional soybean research program, comments: "Soybeans will produce their own nitrogen if properly inoculated with nodule bacteria. These bacteria will live for several years in the soil and no yield response has been obtained from inoculation where nodulated soybeans have been grown in the past three to five years. However, if nodulated soybeans have not been grown in recent years, be sure to inoculate seed at planting time with soybean nodule bacteria. When it is necessary to inoculate, do not use seed treatment. If nodules are not present on soybean roots, the plant will require nitrogen fertilization just as cotton or corn.

"Treating seed with Spergon or Arasan will usually result in improved stands. Seed may be treated with these materials at any time between harvest and planting time. Seed treatment will reduce the effectiveness of inoculation, but will not harm the bacteria already in the soil."

• **Varieties** — Lee, a relatively new, nonshattering soybean, appears to do best over most of the Cotton Belt. Lee is recommended in most states; but California and some other states recommend other varieties. (Consult local authorities.)

There are a number of good soybean varieties, and often it is desirable to plant two or more varieties so that they will mature on different dates and reduce the risks at harvest time. For example, Jasper Jernigan, Alabama Extension agronomist, recently commented, "Plant two varieties with different maturity dates. This will improve your chances of 'hitting' August rain, which is essential for good soybean yields. Recommended varieties are Dorman, Lee and Ogden in North Alabama and Jackson, Lee and Ogden in South Alabama.

• **Planting Dates** — Soybeans should be planted after cotton. May 15 to June 15 is the recommended planting period for most varieties in most states. Mississippi recommends May 1-25 planting for the Delta and most areas; West Texas experience favors planting between May 25 and June 10; and California recommends May 25 to June 30 planting. Planting earlier or later than the recommended dates usually materially reduces yields.

• **How to Plant**—Commonly-used planters, such as those for cotton, corn, beans, etc., are easily adapted for soybeans.

Moisture should determine the plant-

(Continued on Page 48)

Started Oil Milling at 14

Grisham Retires, Continues As Abilene Civic Leader

■ **PAST PRESIDENT of Texas Cottonseed Crushers and West Texas Chamber of Commerce is unopposed for city commissioner.**

RAY GRISHAM, Abilene, one of the Texas cottonseed crushing industry's leaders for many years and a civic leader in West Texas, retired March 12 from the position of general manager of mills for Western Cottonoil Co., with headquarters in Abilene.

Grisham has been associated with the firm for 28 years and with the oil mill industry most of the time since he was 14 years of age.

In addition to having served as president of Texas Cottonseed Crushers' Association, and on many oil milling committees and directorships, Grisham is a member of the Old Guard, national honorary organization of crushers.

He is immediate past president of the West Texas Chamber of Commerce and has long been active in Texas Manufacturers' Association. Currently, Grisham is unopposed as a candidate for Abilene city commissioner.

Grisham was born March 12, 1893, at Hickory Creek, Hunt County, Texas, where his father ran a cotton gin. The elder Grisham later became superintendent of the Wolfe City Cotton Oil Co. mill, followed by a move to Hamlin, Texas, in 1907, where he was in charge of the construction of a mill for the Hamlin Cotton Oil Co.

It was there, at the age of 14, that Ray began his long career in the cottonseed oil industry.

"I started there sewing rags (press cloth) by hand," says Grisham, "at 50 cents a day. I did that for quite a while and then we got one of the very first Singer sewing machines ever used for that purpose. It was quite an innovation. Needless to say, I was very happy with it."

The business had such a strong hold on the young man that he quite school for two years, at the age of 14, to work.

"My mother made me go back to school," he explains.

Finishing at Hamlin High School in 1913, he worked his way through two years at the University of Texas, then stayed out to work so that he would have enough money to go back.

He didn't get back because the next year was 1917 and he went into the army. He served as an ambulance driver in France for some time.

For a few months prior to going into the service, Ray had worked as cashier for the Hill County Cotton Oil Co. at Hillsboro, Texas. Upon his return from the service he returned to that company . . . this time as seed buyer.

Early in 1920, at the age of 27, he became manager of the Frost Oil Mill, at Frost, Texas. Three years latter he went with the Lubbock Cotton Oil Co.

On May 1, 1930, he joined Western Cottonoil Co. as manager at the Plainview mill. In 1938 came the move to

Abilene and the position of vice-president and general manager of West Texas Cottonoil Co. (since changed to Western Cottonoil Co.). Several years later he was named to the post of general manager of mills.

On Dec. 12, 1919, he married Miss Audrey Nabors, of McCaulley, Texas. They now have three daughters and two grandchildren.

Ray and his wife are active members of the Episcopal Church in Abilene.

• Southland Offices At Waxahachie

DIVISION General Office of Southland Cotton Oil Company Division of Anderson, Clayton & Co, moved from Paris, Texas, to Waxachachie, Texas, on March 15.

Address of the new office building in Waxahachie is 106 South Monroe; Post Office Box No. is 742; and telephone number is WEstmore 7-2640, Robert L. Horton, general manager, has announced.

Former Mill Employee Dies

William F. Hensley, Porter, Okla., died March 9 in a Muskogee hospital. He was a former employee of Muskogee Cotton Oil Co.

Plains Plan Cotton Weeks

Plains Cotton Growers, Inc., is actively cooperating with the National Cotton Council in encouraging observance of National Cotton Week on the High Plains of Texas.

W. H. ALEXANDER

W. R. POAGE

Speakers for Texas Ginners' Convention

TWO SPEAKERS for the Texas Cotton Ginners' Association convention in Dallas, April 14-15, are shown here. Congressman W. R. Poage of Waco, vice-chairman of the House Committee on Agriculture, will bring news of the latest developments in Washington. Dr. W. H. Alexander, Oklahoma City pastor, is widely known for entertaining and inspirational addresses.

R. D. Wilmans Dies

R. D. Wilmans, Sr., 81, Newport, Ark., died March 14. Starting in business with a gin and general store 60 years ago, he became an extensive landowner, producing cotton, soybeans, rice, cattle and grain. Associated with him were two sons, R. D., Jr., who manages the gin and crops; and James E., who manages the livestock and farm programs.

He also is survived by his wife and five daughters.

And, She Can Cook, Too!

Roberta's In Love

A SECRETARY IN LOVE! That's Roberta Reubell. Roberta is in love with her job and all the wonderful people she works with. And that is why all the cotton people, not only in Oklahoma (where she is secretary to Edgar L. McVicker, executive vice-president of both the Oklahoma Cotton Ginners' Association and the Oklahoma Cottonseed Crushers' Association) but cotton folks all around the Cotton Belt have come to love her too.

Not only is she versatile, competent and efficient, but she loves her work, and brings that wonderful quality of enthusiasm to everything she does.

With friendly smile and outstretched hand, this tall, neatly groomed gal-friday is greeted by many of her cotton associates by first name.

She keeps the books, takes dictation, gets out the mailings, and in her easy efficient manner, keeps the behind-the-scenes activities of the office running smoothly. She takes care of the office duties for both the ginners' and the crushers', under McVicker's direction, and has become a real Oklahoma-cotton-trademark in her 10 years with them.

Roberta got her first taste of the cotton business, under the supervision of the late Horace Hayden, and she says that without the wonderful help and training she received from him, she wouldn't be in her job today.

"He was one of the most wonderful men I've ever met, and it was a real privilege to have worked for him," Roberta said, and that sentiment is echoed by everyone who ever knew him.

Roberta has more than the average run of exciting events in her job. Take for example the year the crushers held their annual convention at Lake Murray, when Marvin Slack was president, and J. D. Fleming (now executive vice-president of the National Cottonseed Products Association) was executive vice-president.

Well, the reports were all typed, records were up to date for committee members, all that mad last-minute dash that only a secretary getting her boss off to a convention can appreciate, were behind her.

Typewriters were loaded into cars, seating arrangments for the annual banquet were safely tucked into a briefcase, cars filled with gas, oil and water checked for the trip from Oklahoma City to Lake Murray—and then it happened.

It seems that Fleming had come down with the mumps, courtesy of his children, and would Roberta mind going on to the convention without him, and holding down the fort.

"Hold down the fort," Roberta says today, "all I wanted to do was pick-up the floor that had fallen out from under my feet, let along hold down any forts."

"But somehow I managed," she said with a laugh, "but it was only because of the wonderful cooperation of Marvin Slack, and the other men."

"Somehow, we got all the reports made, and the convention on the road, and it really wasn't the end of the world,

but it sure looked like it for a while, to me at least," she continued.

Roberta hasn't confined herself to just the business of the ginners and crushers, but has learned all she can about other phases of the industry as well. Because of her unending interest in things-cotton, every year for the past seven years, she has helped her friend Bill Rascoe with the annual convention of the Oklahoma Cotton Exchange.

Roberta and her husband, Robb, have bought a new home in the last couple of years, and she has found time to make all her drapes, cover several chairs, work in the garden, and has just finished her latest project—she made 10 throw pillows!

"I guess you might say that interior decorating is my hobby," Roberta says. "That and puttering around the house."

"And I love working in the garden," she confided. "Not only getting out in the garden, working to get the ground just right, planting and watching things grow, but I love canning what we produce, also."

"Why when we were first married and we lived on the Arthur Crow farm near Waco I used to can by the wash-tub full. And I still do lots of my own canning."

Her "other" activities have included everything from feeding baby calves to raising chinchilla's, all this, you understand, in her spare time.

"A girl has to be versatile in trade organization work," she says. Well I guess so! Especially if you were ever going to try and fill Roberta Reubell's shoes!

• Fellowships Offered To Gin Engineers

THREE FELLOWSHIPS for graduate study in cotton ginning engineering at Clemson College will be awarded for the 1958-59 school year by the Foundation for Cotton Research and Education.

Fellowships provide $2,500 each for one year's study toward a master's degree in agricultural engineering with a concentration in ginning engineering.

Preference will be given to applicants who (1) hold a bachelor's degree in agricultural engineering (2) have had professional experience in agricultural engineering or related work in the Cotton Belt; (3) are engaged in or have arrangements to work in some continuing phase of ginning research or education; and (4) are under 40 years of age and need financial assistance while studying. The graduate school of Clemson must approve a fellowship holder.

Funds for fellowships are provided by The Clayton Fund, Houston; Murray Co. of Texas, Inc., Dallas; and the Continental Gin Co., Birmingham.

Interested candidates may obtain information and applications from: Director, Division of Production and Marketing, National Cotton Council, P. O. Box 9905, Memphis 12.

North Carolina Promotion Group Gets Funds

A $19,000 check has been presented to North Carolina Cotton Promotion Association as the first collection for the organization's funds. Cotton growers last August approved an assessment of 10 cents a bale for promotion. Wiley J. Long of Garysburg is president.

In 25 Communities

West Texans Plan Cotton Weeks

■ **REGIONAL chamber of commerce encouraging activities to help production and use of crop.**

By LOYAN H. WALKER
West Texas Chamber of Commerce

National Cotton Week observances and other activities to strengthen cotton are being actively encouraged in West Texas.

Because the economy of all West Texas is tied so closely with the general health of the cotton industry, much time and effort is devoted annually by the administration, membership, committee structure and staff personnel of the West Texas Chamber of Commerce to study new methods of increasing cotton production, quality and utilization.

In the 132-county area, approximately 58 percent of the land area of Texas, served by the West Texas Chamber, about 65 percent of the entire state's cotton is grown.

In the work of the Agriculture and Livestock Department of the WTCC, many activities center around the promotion of cotton and cotton products.

One part of this program is to encourage every community in West Texas, where there is an appreciable amount of cotton production, to participate fully in the activities of National Cotton Week. We inform local chambers of commerce of the availability of promotion material from the National Cotton Council and urge that they make full use of it.

This year, 25 West Texas cities have informed us that they will observe National Cotton Week.

These cities include: Lubbock, Crosbyton, Littlefield, Levelland, Denver City, Lamesa, Waco, Plainview, Childress, El Paso, Floydada, Fort Stockton, Archer City, Stanton, Brownfield, Hale Center, Merkel, Ralls, Pecos, Seminole, Post, Tulia, McCamey and Midland.

WTCC encouraged those local chambers of commerce which already had Cotton Week observances to expand the program and also encouraged those communities which did not observe the week to begin doing so.

In the months to come, the WTCC agriculture and livestock committee, headed by J. C. Porter of Wichita Falls, will be doing additional study to determine new methods of promoting King Cotton in his favored domain.

Have Cow—Will Travel

U.S. cattlemen have cows, so they will travel. Two planeloads of U.S. purebred dairy cattle left Madison, Wis., recently for Colombia, South America. They are being exchanged for tours of Colombia being made by U.S. dairy farmers. Colombia cattlemen started the idea, and hope to get other farmers in this country to swap cows for tours.

Crushers To Entertain During Feeders' Day

Texas Cottonseed Crushers' Association college relations committee will be host to leading cattlemen of the Southwest March 31 at a dinner in Lubbock. W. D. Watkins, Abilene, is chairman of the committee.

The dinner will precede the April 1 Cattle Feeders' Day at Texas Techonological College, where results of steer feeding tests with cottonseed products will be reported. The tests were conducted by Tom Neff, graduate student holding a fellowship from the Texas Association. Lubbock oil mills will be hosts at a barbecue at noon. Dean W. L. Stangel of Texas Tech will be honored by the crushers at the luncheon for his longtime leadership.

Oil Mill Collapsed

An oil mill in Memphis fell into the Mississippi 75 years ago, the Commercial Appeal files show. Hanauer Oil Mills, on the river near the foot of Adams Street, caved in March 7, 1883. A portion of the 500 tons of oil cake was saved before the building collapsed.

Wins 4-H Cotton Contest

Jerry Whitfield, Pemiscot County, won the 1957 Three-Bale Cotton Contest. Missouri Cotton Producers' Association is the sponsor. The 4-H Club boy made 1,225 pounds of lint per acre on a two-acre plot. Adverse weather reduced all yields.

• Cotton Film Will Be Shown Abroad

"COTTON—Nature's Wonder Fiber," a 27-minute color movie produced by Cotton Council International, has been selected by the U.S. government for showing in U.S. pavilions at the Brussels World Fair in Belgium, April 17 to Oct. 19, and at the Osaka International Trade Fair in Japan, April 12 to April 17, Read Dunn, CCI executive director, has announced.

In addition to a constant stream of tourists and visitors, thousands of textile industry officials and buyers will have an opportunity to see the film, the first complete story of modern cotton from the seed breeder to the high fashion salon.

The movie was premiered in January at the annual meeting of the National Cotton Council and received enthusiastic acclaim here and at all subsequent showings.

Cotton industry organizations in at least 11 countries are arranging for prints of the film in their own languages in order to use it in educational and promotional work. The National Cotton Council is in charge of U.S. distribution.

The film, in addition, is being considered for showing at international trade fairs in Australia, Brazil, and India.

Cotton Group To Hear Kline

Allan B. Kline, former president of American Farm Bureau Federation, will address Texas Cotton Association convention, March 27-28. John D. Locke, Houston, heads the organization, which is meeting at the Shamrock Hilton in Houston.

Missouri Producers To Meet

Missouri Cotton Producers' Association will hold its annual meeting at Kennett on April 10.

NCPA To Hear Butz

EARL L. BUTZ, Purdue University dean of agriculture and former Assistant Secretary of Agriculture, will address the National Cottonseed Products Association convention, May 5. The meeting is at the Atlanta Biltmore.

ABOVE, left, are officers of the Arkansas-Missouri Cotton Ginners' Association, left to right: W. Kemper Bruton, Blytheville, Ark., executive vice-president; Ross Hughes, Jr., Blytheville, secretary; Lon Mann, Marianna, Ark., second vice-president; Tom Murchison, Coy, Ark., first vice-president; Bill Joplin, Jr., Hayti, Mo., president; R. S. Barnett, Jr., Altheimer, Ark., immediate past president. Picture on right shows 1957 officers of the Tennessee Ginners' Association, left to right: John E. Gauldin, Jr., Dyersburg, Tenn., president; Waring Hazlehurst, Bemis, Tenn., vice-president. Both were re-elected for 1958.

In Memphis, March 10-11-12

Ginners Told Quality Needed To Hold Cotton Markets

■ **SPEAKERS at Midsouth Gin Exhibit stress danger in failure to meet foreign and domestic demand. Growers urged to plant all authorized acres this season and harvest properly.**

LACK of quality cotton may cost U.S. growers markets for two million bales this season, and the threat from manmade fibers was never greater, National Cotton Council representatives told the ginners at Midsouth Gin Supply Exhibit March 10-11-12 at Memphis.

Producers should plant all authorized acres and preserve maximum quality in harvesting, Read Dunn, Council foreign trade director, said. He urged ginners to exercise special care in processing to maintain quality.

Dunn said there was a possible export market of seven to eight million bales for U.S. cotton in the future, "if we have the qualities customers want and are competitive in price and promotion."

George S. Buck, technical assistant to the Council's executive vice-president, said the increased threat from manmade fibers is because the number of synthetic fibers has increased greatly and more soon will be marketed, and their quality has been improved.

• **Business Sessions**—Arkansas-Missouri Cotton Ginners' Association and Tennessee Ginners' Association held their annual conventions in conjunction with the Midsouth Exhibit, which these organizations sponsor in cooperation with Louisiana-Mssissippi Ginners' Association. Louisiana-Mississippi ginners will hold their Association business meeting later, and elect officers.

Officers of Arkansas-Missouri Cotton Ginners' Association are Bill Joplin, Jr., Hayti, Mo., president; Tom Murchison, Coy, Ark., first vice-president; Lon Mann, Marianna, Ark., second vice-president; W. Kemper Burton, Blytheville, Ark., executive vice-president; and Ross Hughes, Jr., Blytheville, secretary.

Tennessee Ginners' Association re-elected for 1958 President John E. Gauldin, Jr., Dyersburg; and Waring Hazlehurst, vice-president, Bemis. Hazlehurst also will serve as secretary-treasurer. W. T. Pigott, Milan, who has served many years as secretary-treasurer asked that he not be re-elected.

The Associations held their annual banquets and floor shows Tuesday evening at the Peabody Hotel. These were preceded by a social hour.

Other entertainment included special features for the ladies attending.

"Quality, as Viewed by a Competitor" was the topic discussed by J. Russell Kennedy, Calcot, Inc., Bakersfield, Calif.

Kennedy said ginners often are blamed for whatever is wrong with cotton, but that they are trying to please customers by giving them the highest possible grade, staple and gin turnout. "These goals are often incompatible" under present harvesting conditions, he added.

The California leader called quality preservation an "industrywide job." He told how California gins have employed an authority to analyze their operations and suggest changes as needed throughout the season.

Lon Mann, ginner of Marianna, Ark., discussed quality in terms of ginning; and Battle P. Ewing, Mississippi cotton farmer, spoke on quality in relation to the income of the producer.

Gerald Dearing, cotton columnist for the paper, read the address of Commercial Appeal Editor Frank R. Ahlgren, who was ill.

This speaker also emphasized the importance of quality and competitive pricing, bringing out the additional need for expanding production.

• **Displays** — Gin machinery manufacturers and other suppliers to the industry had many displays in the Shelby County Building at the Midsouth Fairgrounds.

W. Kemper Bruton, executive vice-president, Arkansas-Missouri Cotton Ginners' Association, Blytheville, Ark., is exhibit chairman. He outlined plans for 1959 in a talk at the conclusion of the conclusion of the Tuesday business program.

• Superintendents Set 1959 Dates

WEST COAST DIVISION, International Oil Mill Superintendents' Association, will hold its 1959 meeting on March 13-14-15 at Bakersfield, Calif.

A record 370 persons registered for the recent meeting at Long Beach. Officers elected were:

Harold F. Crossno, California Cotton Oil Corp., Los Angeles, was again appointed the general chairman for the Twelfth West Coast Meeting.

W. Sidney Switzer, S. A. Camp Co., Shafter, Calif., was appointed meeting chairman.

Earl D. Garner, San Joaquin Cotton Oil Co., Chowchilla, Calif., was appointed vice-chairman.

Ned Mitchel, Producers Cotton Oil Co., Fresno, Calif., was appointed co-chairman.

Members of the West Coast Ladies' Auxiliary appointed the following officers: Mrs. Ruby Crossno, chairlady, Downey, Calif.; Mrs. Pat Stewart, president, Norwalk, Calif.; Mrs. Gloria Hudson, vice-president, Fresno, Calif.; Mrs. Mildred Bitters, secretary, Kingsburg, Calif.; Mrs. Lillian Connley, corresponding secretary, Phoenix, Ariz.; and Mrs. Mabel Quinn, Jr., past president, Los Angeles.

New Bulletin

LINT CLEANING EFFECTS, COSTS IN ARKANSAS GINS STUDIED

"Effects and Costs of Cleaning Lint in Arkansas Cotton Gins" is the title of Arkansas Experiment Station Bulletin 595. Single copies are available free from the University of Arkansas Bulletin Room, Fayetteville.

Data were collected from 26 gins in 1954 and 31 in 1955. All gins were equipped with lint cleaners and were located in Northeastern Arkansas.

Texas Groups Launch Campaign To Get Cotton Acres Planted

A CAMPAIGN to encourage cotton planting was launched in Dallas March 15 by the Statewide Cotton Committee of Texas. About 50 representatives of ginners, producers, crushers, merchants, gin machinery manufacturers, and other groups attended.

Objectives are (1) To show farmers why it will be profitable to withdraw land from the Soil Bank before the March 28 deadline; (2) To encourage planting of every allotted acre.

Chairman Burris C. Jackson of the Statewide Committee presided. He outlined the serious economic losses resulting from the Soil Bank, "a foolish waste of public money used to stop farmers from farming and wreck an industry built up for 150 years."

C. B. Spencer, agricultural director, Texas Cottonseed Crushers' Association, cited his own farm as an example of why growing cotton will be more profitable than putting land in the Soil Bank.

He estimated that the Soil Bank will cost Texas almost $1 billion in potential revenue in 1958, but emphasized that there was a great opportunity to make money growing cotton on the remaining acreage.

Edward H. Bush, executive vice-president, Texas Cotton Ginners' Association, outlined the economic loss to the ginning and allied industries from the Soil Bank. He also stressed the opportunity farmers have, saying "We believe every citizen . . . should encourage his farmer friends to plant and produce a high quality crop for 1958."

Others also pointed out the economic danger in the Soil Bank, but the opportunity for cashing in from the demand for quality cotton and the good yield prospects in 1958. Speakers included Carl Cox, W. D. Felder and Co.; Jack Stoneham, speaking as a representative of American Cotton Shippers' Association; J. D. Prewit, Texas Extension Service; Roy Forkner, president, Texas Cotton Ginners' Association; Loyan Walker, West Texas Chamber of Commerce; Dr. A. B. Cox, cotton economist; D. C. Prince, Lubbock Cotton Exchange; and others.

Spencer, chairman of the Cotton Production Committee which already has widely publicized the opportunity cotton offers Texas growers, was appointed to head the over-all future campaign. Serving with him are Bush and representatives of the three regional chambers of commerce.

Jackson also appointed special radio and television committees and press committees to publicize facts about the need for quality cotton, the good price outlook and the favorable moisture situation which promises good cotton yields in 1958.

How To Invite a Depression

A man lived by the side of the road and sold hot dogs.
He was hard of hearing so he had no radio.
He had trouble with his eyes so he read no newspapers.
But he sold good hot dogs.

He put up signs on the highway telling how good they were.
He stood by the side of the road and cried: "Buy a hot dog, Mister."
And people bought.
He increased his meat and bun orders.
He bought a bigger stove to take care of his trade.
He got his son home from college to help him.
But then something happened . . .
His son said, "Father, haven't you been listening to the radio?
There's a depression on.
The European situation is terrible.
The domestic situation is worse."
Whereupon the father thought, "Well, my son's been to college,
He reads the papers and he listens to the radio, and he ought to know."
So the father cut down on his meat and bun orders,
Took down his advertising signs,
And no longer bothered to stand out on the highway to sell hot dogs.
And his hot dog sales fell almost overnight.
"You're right son," the father said to the boy,
"We certainly are in the middle of a great depression."

—*The Clarkson Letter.*

from our Washington Bureau

by FRED BAILEY
WASHINGTON REPRESENTATIVE

The Cotton Gin and Oil Mill Press

• **Post-Mortems on Allotment Bill** — Senate vote that killed off any chance there might have been for legislating an increase in allotments for this year's crop has given rise to an assortment of post-mortems.

Four major reasons seem to have been behind the defeat for cotton. And they are meaningful not just for blame-fixing, but as an indication of what may be ahead in farm legislation.

First, was the bill itself. Many congressmen we've sounded out doubted the shortage of quality cotton was as serious as made out to be. And, even if so, they didn't regard it as consistent to boost acreage while spending $282 million for cotton Soil Bank. Quite a few never really understood the arguments to the contrary.

Second, the unwillingness of Farm Bloc congressmen to vote for any measure just for a single commodity. Many figured that "if we don't hang together, we'll hang separately."

Third, the inability of the Farm Bloc to muster votes among city congressmen . . . proof, if any is needed . . . that the Farm Bloc as it once was, is dead as the proverbial doornail.

Fourth, the tireless battle by Secretary Benson and his aides to drum up opposition. For two solid days prior to the vote, USDA officials were phoning and visiting with Midwest lawmakers, urging they vote nay. What USDA told them, we've learned, was that more cotton would mean more cottonseed, and that this would mean more competition for Corn Belt soybeans. It wasn't pointed out that more Southern cotton would likewise mean less Southern soybeans and feed grains planted.

• **Veto for Freeze Bill** — The general price support freeze bill, even its backers now concede, faces an almost certain veto . . . a veto that Congress probably can't collar votes to override.

The measure, even if it were made law, would affect cotton only in that it would prohibit USDA from cutting the national acreage allotment in 1959. Since cotton price support is to be above the 1957 level, it wouldn't be involved.

Will 1959 allotments be further slashed if the "hold the line" fails, as it seems certain to do. There is a good deal of disagreement on the answer to this.

Senator John Stennis says the answer is yes. In a floor speech just prior to the rollcall on the support and acreage allotment, he warned that: "If this legislation is not enacted into law and marketing quotas are reduced to the 10-million-bale minimum, the national cotton allotment for the crop year 1959 will go to 13,700,000 acres as compared with 17,500,000 acres for 1958."

Our checking with cotton economists here—in and out of government—indicates that, although this could happen under the present law, it's not likely. The reason is that the current and prospective supply-demand balance is too favorable . . . won't permit a big reduction under the formula which Congress provides.

Work on an "omnibus" farm bill is to be stepped-up regardless of whatever action's taken on the support freeze measure. But it's to be strictly for political purposes. Even before the first word is written, a veto is freely predicted. Idea is to be able to tell voters in November that: "We tried to do something about the farm situation, but the White House vetoed it."

When you begin hearing talk of a new cotton plan going through Congress—and it will likely be a domestic parity plan—be forewarned of both its purpose and its chances of becoming a law.

• **Seek To Revive Barter**—Senate Agricultural Committee has taken the first steps to revive the "barter" program which USDA all but killed in May, 1957. Under it, quite a bit of cotton, cottonseed, and cottonseed oil was being swapped to foreign countries in exchange for more storable commodities—mostly minerals. This has been tacked on to legislation which would extend Public Law 480. In addition; the bill sets $500 million a year as both the goal and the limit for bartering; changes the provision that only "strategic" materials can be taken in trade so as to permit swapping for any item that the U.S. is short on; and eases the ban on minerals that are domestically processed.

• **"As Maine Goes . . ."** — The state of Maine is a long ways from the Cotton Belt. None-the-less, action by USDA there last week may have a significant bearing on cotton. This was the decision to accept about one out of every four bids by farmers to place whole farms in the conservation reserve. All bids from farmers in the other three trial states —Tennessee, Nebraska, and Illinois— were rejected as being too high.

USDA had secretly made an arbitrary decision, prior to opening the bids, that it would accept all that were no more than 30 percent higher than the rate available, under the regular conservation reserve program. Washington insiders doubt that such a decision would have been made were USDA not willing to offer the same deal to farmers in all the other 47 states when the 1959 program begins next fall. Thus, the acceptance of Maine bids is regarded as a tipoff of future policy. As additional evidence of this, it is worth noting that USDA has asked that funds for the conservation reserve be increased by $125 million—again 40 percent—beginning with the 1959 fiscal year, yet has given no indication just how it intends to use the money.

A 30 percent increase in the rate for whole farms, Soil Bank officials here admit, might hold quite an attraction for many Southeastern farmers.

Acreage allotments for sale? This idea has been kicking around in Farm Bloc circles for some time. But there's much more being said about it nowadays. Allowing farmers to sell their allotment to the highest bidder would (some think)

T. H. HOPPER

GEORGE W. PFEIFFENBERGER

Authorities on Cotton Clinic Program

TWO AUTHORITIES who will be among those on the program for the Cotton Merchandising Clinic a tthe University of Texas, Austin, April 10-11, are shown here. T. H. Hopper, USDA Southern Regional Research Laboratory, New Orleans, will talk on "How Feasible Is a Single Test for Fiber Strength, Maturity and Fineness?" Immature cotton will be the subject discussed by George W. Pfeiffenberger, executive for Plains Cotton Growers, Inc., Lubbock, and for many years a research authority on cotton with USDA and private industry. A full program of cotton merchandising topics has been arranged by Joel F. Hembree and his associates, Cotton Research, University of Texas, and the Cotton Research Committee of Texas.

be one way to give small farmers a stake to get off the farm and at the same time allow the big producer to become bigger and more efficient.

There's not much chance of such action being taken this year. But unless we miss our guess, it's going to be one to watch. The effect, of course, would depend on the wording of the legislation. But one can be fairly certain that Southeastern Congressmen would insist on a provision barring "interstate" sale. This would prevent any regional shift in production . . . the thing that Western producers are most interested in.

Eyes of Texas Focused On Drip-Dry Cotton

Drip-dry cottons were publicized March 18 by Murray Cox, radio farm director, WFAA, Dallas, on his radio program at noon. The valuable publicity resulted from the work of Bill Foreman and Ford Boyd of the National Cotton Council staff.

Cox is sponsoring a farm tour, and someone heard that he recommended nylon shirts. The Cotton Gin and Oil Mill Press editor suggested to the Council that there might be an opportunity to publicize cotton, and Foreman and Boyd sent the following tape recording to Cox:

"FOREMAN: Hi, Murray . . . this is Bill Foreman.

BOYD: . . . . and Ford Boyd . . . of the National Cotton Council . . .

FOREMAN: We heard about you Texas farmers being worried about how you're going to keep your shirts clean while you're on your tour . . . Somebody—and I heard it was Murray Cox—even suggested wearing a nylon shirt that you could wash out every night and put on the next morning . . . . With this tape and our compliments, is a new DRIP-DRY COTTON SHIRT. You can wash it every night and put it on the next morning without having to iron it . . What's more, it won't be clammy and stick to your skin and you won't feel like you're wearing a raincoat . . . But if you go ahead and wear nylon anyway, here's what will happen:

SONG: (BOYD WITH FOREMAN ACCOMPANYING ON HARMONICA):

The eyes of Texas are upon you,
For nylon shirts you wear.
The eyes of Texas are upon you,
As farmers tear their hair.
Do not think you can escape them
By leaving early in the day.
If you do not change to cotton,
They'll haunt you all the way."

In his broadcast, Cox mentioned that the matter had been called to the attention of the Council by The Press editor, adding "of course, I'm not plugging nylon when cotton is still the biggest source of income Texas farmers have." He then played most of the tape recording, but omitted the song.

Hollowell Aids Show

E. T. Hollowell, NCPA Research and Educational Division, was assistant manager at the Georgia Barrow Show, March 10 at Americus.

• Battelle and USDA Plan Cotton Study

CHEMICAL TREATMENT of cotton fabrics will be studied by Battelle Memorial Institute, Columbus, Ohio, under a contract with USDA's Southern Utilization Research and Development Division of the Agricultural Research Service, New Orleans.

Exploratory trials have indicated that treatment of cotton fabrics with ethylene ureas and ethylene amides imparts some desirable wash and wear properties. These and other possible effects of the treatments are to be investigated more fully by scientists at Battelle Memorial Institute. These compounds alter some properties of cotton by forming polymers in and on the fibers, and it is anticipated that thorough exploration of their effects may reveal other desirable properties as results of the treatments.

The Southern Division is headquarters for USDA cotton utilization research. Leon Chance, of the cotton chemical laboratory, will supervise work under this contract for USDA, and Dr. R. I. Leininger, assistant chief, rubber and plastics division, will direct the work at Battelle.

Crushers Make Awards

Crushers of the Valley area have provided cottonseed meal for awards to 4-H and FFA exhibitors at the Midsouth Livestock Exposition, April 3-5, at Memphis. Dalton Gandy, NCPA Research and Educational Division, and C. E. Garner, Valley Oilseed Processors' Association, have worked on the program.

Heads Mill Tour

ROY FORKNER, Canyon Gin, Lubbock, is especially busy this spring. He not only is president of Texas Cotton Ginners' Association, which is planning its annual convention in Dallas, April 14-15—he also heads the West Texas group planning a mill tour, April 21-23. Sponsors are Plains Cotton Growers, Plains Ginners' Association and Lubbock Cotton Exchange. The group will fly to Greenwood, S.C. American Cotton Manufacturers' Institute will be host, and the West Texans plan to invite ACMI representatives to visit the High Plains next October.

Texas Crushers' Directors Hold Dallas Meeting

Texas still has an opportunity to make a good cotton income by increasing yields, despite the Soil Bank, C. B. Spencer, agricultural director, Texas Cottonseed Crushers' Association, told the board of directors March 17. Spencer pointed out that the five-year average yield would produce about three million bales, a 300-pound yield would make 3,200,000 bales and, by setting a new high in yields, it would be possible for Texas to produce 3,500,000 bales.

Postmen Don Wash-n-Wear But Not Cotton

Uncle Sam's letter carriers can wear summer uniform trousers of wash and wear material, but it's not cotton.

The Post Office has approved postal uniforms of a lightweight tropical blend of 70 percent Dacron, 20 percent Orlon and 10 percent mohair. The fabric weighs about 8.5 ounces per yard (60 inches wide) as compared with 10 to 13 ounces for "traditional summer uniform fabrics" and trousers sell for slightly less than "conventional worsted trousers approved for summer wear," the announcement said.

• Arizona "Sunshine Cotton" Featured

ARIZONA Cotton Growers' Association has launched a campaign to promote Arizona's "Sunshine Cotton."

A committee headed by Keith Walden has planned advertising to call attention to the merits of the state's fiber.

Plans call for having a selected group of mill representatives visit the state next fall to see cotton picked and ginned.

John E. Mitchell Co. Honored

John E. Mitchell Co., Dallas, has been honored for "outstanding community service rendered by employment of the handicapped." Goodwill Industries presented the award March 18 to the firm, noted for religious and humanitarian principles in its management.

Awning Research Studied

Cooperative research with canvas awnings was discussed March 3-4 at a conference of representatives of Canvas Products Association International and USDA in New Orleans.

New Bulletin

1958 EDITION OF SOYBEAN YEARBOOK PUBLISHED

American Soybean Association has published the 1958 edition of the Soybean Bluebook. Copies cost $5 each from the Association executive offices, Hudson, Iowa. The cost includes Association membership and a subscription to the Soybean Digest.

Official standards for soybeans, statistics, lists of processors and other information useful to the industry are contained in the publication.

COTTON INDUSTRY LEADERS shown here spoke at the opening session of the 1958 Western Cotton Production Conference, March 4 at El Paso. They are, left to right: Robert W. Smith, vice-president, Lowenstein Cotton & Storage Corp., Anderson, S.C.; E. D. White, associate director, Office of Food and Agriculture, International Cooperation Administration, Washington; Dr. Robert H. Black, dean and director of agriculture, New Mexico A&M College, State College; Mitchell Landers, executive vice-president, SuPima Association of America, El Paso; and Cecil H. Collerette, chairman, production and marketing committee, National Cotton Council, Casa Grande, Ariz., who served as general chairman of Conference.

Developments in Western Cotton Production Practices Outlined

Ways to lower cost and improve quality of fiber are explored at conference held March 4-5 at El Paso. Southwest Five-State Cotton Growers Association, National Cotton Council and other cooperate in sponsorship.

REPRESENTATIVES of research institutions and the cotton industry gathered March 4-5 at Hotel Cortez, El Paso, Texas, to analyze ways to improve quality and reduce costs. They met at the 1958 Western Cotton Production Conference. Sponsors of the annual meeting are the Southwest Five-State Cotton Growers' Association and National Cotton Council of America. Cooperating with them are many groups including land-grant colleges, USDA, the agricultural chemicals industry, vocational agriculture leaders, farm organizations and others.

El Paso Valley Cotton Association and the SuPima Association of America were hosts for the 1958 meeting.

The following addresses constitute the summary-proceedings of the Conference, and will be distributed by the sponsors as reprints from The Cotton Gin and Oil Mill Press.

Opening Statement

CECIL H. COLLERETTE, General Chairman; Chairman, Production and Marketing Committee, National Cotton Council.

The purpose of the conference is to search out and carefully evaluate ways and means of lowering the cost of producing a bale of cotton, and improving the quality in that bale. Even though our Western area has blazed the trail toward lower costs and better quality, there has never been a time when the need for more progress was as great as it is today.

Cotton must be competitive in price and quality if our markets are to even be maintained—much less enlarged—and those markets *must* be enlarged if we are to move toward more production on a lasting basis. There's pretty convincing evidence that during recent years our prices have not been competitive—that they have been out of line in relation to the price and quality of synthetics, and of foreign cottons—and that because of this, we have been giving up some markets that otherwise could have been ours. But if meeting price competition means accepting lower prices for our cotton, how can we make a resonable income out of growing it . . . unless we can also lower our costs? And how can our costs per pound be lowered except through research and its application or through expanded production—or better still, through both?

So we again focus our attention on lower costs and better quality. We have been hearing quite a bit lately about the quality of the United States cotton supply. We producers in the Irrigated Southwest think we grow a good quality fiber. Within the memory of most of us, we have progressed from a quality that was discounted to one that it in demand. A major question now is how much more can breeders improve the inherent quality of our cotton—and are we producers, ginners and handlers exercising every reasonable care to maintain inherent quality until our fiber reaches the mill?

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Welcome Address

DR. ROBERT H. BLACK, Dean, Director of Agriculture, New Mexico A&M, State College.

Research is highly important to everyone. In our college programs, it leads the way to the development of better crops, encourages better management practices, and vitalizes the teaching program.

The Agricultural Extension Service is the action unit of the college program which carries the latest facts of research findings and new information to the farm and ranch people of the State. All three areas, teaching, research, and extension, are important and work together to fill the needs of future agriculture.

Much research must be done if we are to improve the cotton which we now have. This research will be aimed in many directions and in many areas. Al-

though we believe that the cotton in the Southwestern areas is of the very finest quality, we must continue doing research to improve on the quality which we now have. We must promote research on breeding for strength of fiber, breeding for yield, and to improve our techniques in marketing and merchandising. Investigations into disease resistance and insect control are very vital to the cotton future. More studies are needed in weed control, irrigation, and mechanization. We need to know more about the soil and how we can use fertilizers to the best advantage. Finally, we need to know more about textiles and how we can improve them.

Our production research has outdistanced the research in the marketing and utilization fields. We have built up surpluses in certain areas. However, this production ability is an advantage which we cannot afford to lose. It is the most important advantage that America holds over other countries in the world today. Food and fiber are necessary in order for a nation to exist.

Certainly we are in favor of national defense, and we feel it absolutely necessary that we develop and maintain our facilities to protect this Country; yet, we do not believe that these programs should be carried on at the expense of research in agriculture. If we are to grow and progress normally as a nation, we must continue to intensify our research in agriculture and in all other fields in order that we might move forward in a well-balanced fashion, rather than to go by spurts in various areas and then fall back on crash programs to even out the economy.

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Cotton's Situation In Today's World

E. D. WHITE, Associate Director, Office of Food and Agriculture, International Cooperation Administration, Washington.

Cotton is in a stronger position in world markets today than it has been for a number of years. Cotton prices throughout the world have been stabilized to a great extent and this has encouraged textile mills to stock and spin more cotton, and the supply has been ample to meet all needs. Stocks of raw cotton in all countries, except the U.S., have moved into consumption channels at satisfactory rates and in the U.S. the large surplus has been greatly reduced.

The cotton situation here is quite different from that in other cotton producing nations. Other nations, except the extra long staple producers—Sudan and Egypt—no longer hold large stocks of surplus cotton and their 1957 crop is adequate to meet the demand. In the U.S. there are still large stocks of cotton —11 million bales at the beginning of this season. But the 1957 crop was not balanced. There was too much low grade cotton and too little high grade. However, if the total supply of the better qualities of cotton is properly distributed through trade channels, it should about cover the 10 million bale requirement for this type of cotton for domestic consumption and for export this season.

• **Production** — The production of cotton in the U.S. last season is estimated at slightly less than 11 million bales. This is somewhat smaller than the crop of nearly 12 million bales 20 years ago. In contrast, the production of cotton elsewhere in the free world during this 20-year period increased from nearly 12 million bales to 16 million. Since the 1949 season, total cotton production throughout the free world has increased by less than one million bales. However, during this same period free world foreign cotton production has increased nearly six million bales or by nearly 60 percent. The difference lies in the reduced production in the U.S. where, under acreage control programs, production has been reduced from 16 million bales in 1949 to slightly below 11 million bales in 1957.

It seems clear that cotton production in foreign countries will continue to expand. By 1962 the production of cotton in the free world outside the U.S. may amount to between 18 and 19 million bales—about 20 percent more than at present. Because foreign nations do not withhold cotton from world markets over long periods of time, it is anticipated that all of the increases in foreign production will move into consumptive channels.

The world should recognize that there still remain large areas of fertile lands yet to be developed within the latitudes suitable for cotton growing. It is only logical to expect that underdeveloped nations will develop and put to beneficial use those good land and water resources that have been only slightly used or not used at all in the centuries of the past. It is important that cotton producers everywhere recognize this situation and make realistic plans for the future.

• **Consumption** — While cotton production has been rising significantly in the free world during the past few years, so has cotton consumption. Since 1949 the consumption of cotton in the free world has increased from nearly 24 million bales to nearly 30 million bales, or by about 25 percent. Essentially all of this increase occurred in countries outside of the U.S. In the foreign free world the increase in cotton consumption amounted to over 40 percent or about six million bales. During this same period—consumption of cotton in the U.S. has shown some a tendency to decline.

The reason for the increase in cotton consumption overseas is partly, if not mainly, the increase in the capacity to manufacture cotton textiles in the nations where cotton is now being grown. During the past several years exports and imports of cotton—on a world basis—have remained static at around 10,500,000 and 11,500,000 bales a year, while at the same time cotton consumption in overseas areas was expanding by over 40 percent.

Western Conference To Be in Phoenix

Sponsors of the Western Cotton Production Conference have announced that this meeting will be held in Phoenix, Ariz., in 1959. The dates will be March 3-4, and the Westward Ho will be headquarters for the meeting.

Another thing of interest is the significant trend toward the purchase and use of more high grade cotton on the part of importing countries. The difficulty in hiring mill labor and meeting higher wage demands has made it desirable for mill management to shift to increased use of high quality cotton.

One of the most favorable factors which will influence the increased use of cotton in the years ahead is the growth of population in the world. About 40 million people are being added to the population of the world every year and on the average each person in the world is consuming 6.6 pounds of cotton.

Another factor which will increase cotton consumption, is the improvement in the purchasing power of the people. As purchasing power improves, larger amounts of money are available for the purchase of clothing.

• **Rayon** — Cellulose manufactured into both rayon filament yarns and rayon staple fiber has been and is continuing to find an expanding market—one that consumers are finding acceptable in lieu of cotton. In 1950, world production of rayon staple fiber amounted to the equivalent of 3,250,000 bales. Only six years later—in 1956, the production of rayon staple fiber amounted to 6,250,000 bales. World production of both filament yarn and rayon staple fiber in 1956 amounted to 11 million bales.

While style appeal and fiber characteristics account for a significant part of the rapid growth in the production of rayon—prices have also been important. Whenever cotton is supported at prices substantially higher than rayon, there is an incentive to shift to the use of rayon. Such shifts have been significant in recent years. Another factor that has contributed to the growth in rayon production in foreign countries is that it is a "national" fiber—one that can be manufactured locally and—does not require dollars or other foreign exchange for its purchase.

• **Exports** — The exports of cotton in the free world last season amounted to 14,200,000 bales. The high exports of last season resulted from an increase in U.S. exports—from 2,200,000 bales in the 1955-1956 season to 7,600,000 bales last season. The exports of cotton this season —both from the U.S. and from other countries—are likely to approach a more normal amount. While the export of cotton has been and promises to remain fairly stable, cotton consumption in the foreign free world is increasing significantly.

It seems clear that cotton must be priced more competitively with rayon than it has been in the past before any permanent large increase in cotton exports on a world basis can take place. Since many of the nations that account for the increase in cotton consumption are producing more cotton for their own use, larger cotton exports are likely to take place only in the non-cotton growing importing nations. It is in these countries that a large part of the 8,500,000 bales of rayon is now being produced.

The foreign free world exported nearly 5,400,000 bales of American Upland type cotton last season and this season have for export only about 300,000 bales more. Should all of the cotton available in these countries be exported and should the textile mills in consuming areas buy only minimum requirements for this season, exports from the U.S. could be as

small as 4,750,000 bales. However, that is not likely to occur, (1) because of quality considerations purchasers are not likely to buy all of the cotton available for export in the exporting nations, and (2) textile mills are not likely to buy only minimum requirements for this season, for that would require reducing mill stocks to uncomfortably low levels. Futhermore, the U.S. export sales program for this season now amounts to nearly 5,400,000 bales. Additional sales will increase this amount to some extent before the present season ends on July 31. It would seem, therefore, that if this amount of cotton is exported from the U.S. and is sold to consuming mills—that exports from other producing nations this year may be slightly less than the amount that is available for export from these nations.

• **Import Requirements** — The cotton import requirements for all countries in the free world may, during the next five years, increase by about 1,500,000 bales to about 14 million bales. This would be equal to free world imports of cotton last season. By the 1962 season, cotton growing nations outside the U.S. are likely to have between seven and eight million bales of cotton available for export after having met increased needs for cotton in their own countries. But, it is not likely that free foreign importing countries will be able to buy the remainder of their requirements from the U.S. with dollars. The scarcity of dollars on the part of cotton importing nations has been and continues to be a limiting factor in importing cotton from the U.S. It is conceivable that because of dollar limitations foreign countries may be able to import no more than five to six million bales from the U.S. five years from now, including the cotton received through foreign aid. This assumes no important change during this period in present world prices for cotton.

• **Price** — Cotton prices have remained reasonably stable throughout the world during the past year and a half. More stable prices have encouraged textile mills the world around to replenish stocks and to take renewed interest in cotton textile manufacturing and sales. Since foreign exchange requirements for the importation of cotton in importing nations are large and—since the textile industry generally has more people employed than in any other single industry—it is important to cotton manufacturing nations that prices be stabilized and be stabilized at reasonable levels.

• **Stocks** — Since 1949 stocks of cotton in the free world have increased by nearly seven million bales or by about 50 percent. Six million bales of this increase—about 85 percent—occurred in the U.S. and the remaining one million bale increase occurred in friendly foreign nations. If exports from the U.S. this season approximate 5,500,000 to six million bales—which is likely—U.S. stocks will again be reduced possibly by as much as three million bales. In which event, foreign stocks might increase again by another million bales and reach a level about 10 percent higher than the comfortable average of recent years.

During the past cotton season foreign mills in the free world rebuilt depleted stocks of cotton. The re-stocking amounted to about 1,700,000 bales. It is not likely that any similar expansion in mill stocks will occur this season.

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How Quality of Cotton Fiber Can Affect Mill Operation

ROBERT W. SMITH, Vice-President of the Lowenstein Cotton and Storage Corp., Anderson, S.C.

The type of cotton that you plant has much to do with the smoothness, fineness and uniformity of the cotton fiber, but your contribution as a producer does not end with the selection of seed. The manner in which you produce your cotton will have a bearing on maturity, uniformity and tensile strength of fiber.

But to grow good cotton is only half the battle. Three campaigns remain — harvesting, ginning, and handling.

Probably the greatest threat which lurks nearby during the harvest season is foreign matter. It can take many forms such as leaves, grass, bark, oil, tar and pieces of cloth and sweaters.

Foreign matter will encourage one of the great dangers which confronts cotton at the gin. That is over-ginning or over-cleaning the fiber. Every time cotton is graded up by excessive cleaning you may rest assured that consumer market for cotton has been reduced. There is another combination harvesting-ginning problem and that is harvesting cotton when it is wet. To do so, invites the use of too much heat in ginning. Too much heat, as does too much cleaning, damages the fiber.

• **The Handling Problem** — Next is this matter of handling. It is something that all of us—producer, ginner, shipper and spinner — should work to correct as quickly as possible.

Mishandling of cotton actually starts before the lint leaves the gin. It starts with the bale cover. In the first place, we must place some blame on the jute bale cover. Jute fiber in the lint is as costly as any foreign matter. Jute bagging does little to protect the cotton from dirt in handling.

And before some of you say that jute bagging is the only bale cover which can stand the weather, let me say: Bales of cotton should not be left exposed to the elements. Cotton should be warehoused immediately after ginning. It is not unusual to receive cotton at the mill which has stood so long exposed that a blue stain has penetrated an inch or more into the bale.

The stained cotton has been made worthless for the purpose for which it was bought.

There may be many persons in the cotton industry who would say, "Don't worry about a little dirt on a bale of cotton. It's natural and can't be helped."

It is more than a little dirt. When bales of cotton are mishandled and excessively sampled, dirt becomes a major problem. In all seriousness, I say American cotton arrives at the mill in the dirtiest, most disreputable condition of any commodity known to man.

Often cotton arrives at the mill with most of the bagging cut away, most of the ties gone. This condition directly contributes in two ways to increased costs. Additional labor, which is a costly factor these days, is required to brush the bales to remove dirt. In addition to the labor costs, the damaged fiber which was bought to manufacture fabric must be discarded as waste. It is tragic to see what we are doing to cotton through mishandling.

• **Manufacturing Problems** — Your part in how well cotton performs in the manufacturing process does not end after the cotton is cleaned and put into the opening room. As cotton moves from the opening room into the cleaning processes, the manufacturing operation feels the effect of the job done by the breeder and the producer.

Both the breeder and the producer have had a hand in the uniformity of the length of the fiber. Fibers which are shorter in length than those required for the type yarn to be manufactured must be removed. Fiber that was bought for yarn and ends up as waste increases the price of yarn.

At this same stage, foreign matter is removed. Foreign matter which was bought as good cotton increases the ultimate cost of the yarn.

The breeder can do nothing about the foreign matter but the producer can. After the mill has removed the foreign matter and short fibers and the fiber goes into the spinning process we reach the key spot in this matter of cotton quality.

We have talked about maturity and uniformity, tensile strength and fineness, over-ginning and over-heating, foreign matter and mishandling. All of these things are merely contributing factors to the spinning quality of cotton.

• **"Ends Down" In Spinning** — Perhaps the best way to record the spinning quality of cotton after it goes into the spinning process is through the term, "ends down." On the spinning frame when the strand of yarn breaks, it is referred to as an "ends down." When an end is down, costly machinery which should be producing yarn is producing nothing. To put that machine back into production, a mill employee must repair the break. As a result, the cost of the yarn increases.

What causes an end down? A lack of uniformity in fiber; fiber with a low tensile strength; jute fiber from the bale cover and other foreign matter that escaped the cleaning machinery; fiber made brittle by overheating at the gin; fiber which was damaged by overcleaning at the gin; fiber that in any way fails measure up to quality of the fiber for which the machinery has been adjusted.

• **Neps In Yarn** — As you may have guessed, the manufacture of the yarn is not the whole story. Not all yarn measures up to the quality desired. One of the chief defects which causes substandard yarn is neps.

Neps, as you know, are masses of broken or immature fiber. It is impossible to remove all neps from the fiber in the cleaning process. A nep will cause rough or uneven yarn. A nep will not dye the same shade as smooth yarn. Neps are caused by immature fiber, which is the business of the producer and by damage to fiber at the gin, which is the business of the ginner.

• **Preserving Quality** — As a fiber, cotton has many favorable characteristics. One of those favorable characteristics is quality. So when we talk about cotton

quality we are not talking about what we can put into it but what we can preserve.

If we don't try to preserve cotton's natural quality we are admitting to ourselves that we don't value our product as highly as the producers of man-made fibers value their products.

Every time a mill has excessive waste or must spend an excessive length of time in the manufacturing process or turns out sub-standard goods, the price of the goods go up.

Success depends on economy in manufacture, producing quality goods, to be sold at a fair price. If waste and substandard products force up the manufacturning cost, the cost of the products must rise. Rising prices bring a decrease in demand. If mills sell less fabric, mills buy less cotton.

As you know, the American consumer does not buy bales of cotton. The American consumer buys products manufactured from bales of cotton. For that reason, you have a very real stake in the size of the consumer market and in the price of consumer products. The best way to protect that stake is to protect the cotton which you produce and handle.

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How Technological Practices Affect Fiber Quality

CLAUDE L. WELCH, Director, Production and Marketing Division, National Cotton Council.

During recent years mill costs for machinery and equipment, materials, labor, taxes and the like have gone up just as they have for the farmer. But the price of cloth is now 20 percent lower than 10 years ago! Because of this mills tell us that the only way to stay in business is to increase efficiency and in doing so they are of necessity, demanding more cotton than ever before.

The mills are fully aware of, and sympathetic with, the recent transition which has taken place in production and ginning. The motivating forces which have brought about changes in mill operations and farm production technology are both for the purpose of reducing costs. Like the mill, the cotton producer who has not taken advantage of improved technology, runs the risk of falling by the wayside.

Mechanical harvesting is one of the farm practices adopted to reduce costs, but in order to make it successful it was necessary to make certain changes in the gin. The gin which is not equipped to handle mechanically harvested cotton, likewise ceases to exist. In a relatively few years, the producer, ginner, and the mill have all had to make radical operating changes to stay in business.

As our industry moved rapidly toward greater mechanization, we solved some problems and created others. In an effort to solve some of these new problems, the USDA and cooperating research agencies have studied the effects which some of the various new practices have had on cotton quality. During the early days of mechanical picking, a concerted effort was made by the ginning laboratories and Experiment Stations to compare costs and qualities of hand- and machine-picked cotton to guide industry and place this new development in its proper perspective. It became apparent that *good* machine picking did not adversely affect the manufacturing performance of cotton. The manufacturing waste from machine-picked cotton was higher because of the increased trash content, but yarn quality was not adversely affected.

• **Improved Ginning** — As gin cleaning equipment was improved and became more efficient, the manufacturing waste difference between hand- and machine-picked cotton from the same field was greatly reduced. Yarn quality in some instances was actually higher from machine-picked cotton. This was attributed to the fact that the machine does not pick "tight locks" which are often harvested by hand pickers. Although information has been developed on how these improvments can be achieved in commercial operations, we know there's a mighty big step between research findings and widespread adoption. The matter of getting this information in useable form to those who can benefit from it is a constant and ever-growing job of our educational forces.

Research has pointed out repeatedly that properly adjusted and operated machines are the most important determinates in quality harvesting. But even when these conditions are satisfied, weed control and defoliation become critical factors.

Some grass can be removed by various mill operations, but that which is not removed causes operational difficulties in spinning and weaving, and therefore, added costs. A small amount of grass in the lint can cause large price discounts to the producer, for very good reasons.

Defoliation has received a great deal of attention over the years. Everyone agrees that a good job of defoliation, if we can get it, will pay dividends. But just when to apply the defoliant to obtain best results and avoid adverse effects on yield and fiber quality is not too clearly defined. Tests have shown that an early application of defoliant will affect the growth of the cotton plant and thereby cause excessive fiber immaturity. The immature fibers will tangle quite easily, causing neps, and consequently, low quality yarns and fabrics Late-season irrigation in combination with an early frost, which is of course uncontrollable, will also tend to reduce the fiber maturity of the late crop.

Numerous tests have been made to compare the possible effects of such practices as hill dropping, drilling and chopping, and flame cultivation on lint quality. Several years' data have failed to show that these practices have any measurable effects on quality.

• **Quality Preservation** — The preservation of the inherent spinning quality of cotton does not just happen. It requires the careful planning of the farmer and cooperation of the ginner. It should be remembered that a gin does not make quality, it can at best only preserve it. Quite often the effects of practices which we have pointed out here are cumulative.

We know a good bit about the individual effects of various practices, but very little about the complications which arise from the cumulative effects of insect control and other production practices, harvesting equipment and ginning. More research on these problems is badly needed and long overdue.

• **Quality Evaluation** — Today, when a farmer decides to plant cotton, what cultural practices to follow, or what care to take in harvesting, we surely can't expect him to be influenced by any quality considerations other than those which will be measured in the channels of trade and for which he gets paid. When a gin machinery manufacturer sells a piece of equipment, or the ginner buys and operates it, we can't expect either one of them to be too much concerned with any kind of quality besides that which the merchant will measure and pay for when he buys the cotton. And, the merchant can only use those tools of measurement which are actually available on a practical basis. The problem is that our time-honored classer's description of quality is no longer adequate.

On the other hand, if we had adequate tools for evaluation, think what it would mean to everyone, everywhere, who is doing research in which the quality of raw cotton is involved. Think of the cotton breeder, the irrigation engineer, the entomologist, the ginning engineering, or the farm implement manufacturer, just to name a few. Without adequate means for measuring quality, how can we expect these people to be too concerned with the effects of their developments upon the quality of cotton and translate these effects into what they will really mean to the industry when we can't really tell them how to measure quality in the first place? And it seems that mills can't really evaluate quality until they have actually run the cotton. Even then they only know that something went wrong. What caused the trouble seems to be a matter of opinion rather than fact.

So, this problem reaches throughout our industry. If we had practical ways to quickly and inexpensively measure more of the real quality of raw cotton, we could revolutionize the efforts which are being made to improve and preserve quality. This all boils down to the basic fact that we need research to provide tools for research and for the commercial evaluation of fiber quality and spinning performance.

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Reflecting Spinning Values in Cotton's Marketing System

OTTO GOEDECKE, Otto Goedecke, Inc., Hallettsville, Texas.

When we first tackled this job of determining what presented top quality in spinning value, we realized that we needed improved techniques in classifying the cotton. Dr. Pressley at the University of Arizona made a most significant contribution in this direction by givng us the Pressley instrument for measuring fiber strength. Dr. Hertel at the University of Tennessee, who worked in cooperation with Mr. Hancock, a geneticist and plant breeder who attempted to improve length uniformity in cotton fiber, developed the Fibrograph. This instrument gave us more than the rule of thumb measurement of a cotton classer; it gave us the co-efficient of

length, the uniformity ratio. This is a very important kind of property.

Fiber fineness also became important, when it was realized that the cotton fiber was three dimensional in scope. This you did not only measure by its length, but by its circumference as well. The Micronaire was the result. All these were instruments developed by scientists. It is through science that we must find further progress.

Several years of acreage restrictions have created a situation where we find ourselves today dangerously close to having a scarcity of high grade quality cotton. The impending threat of scarcity has already raised prices of these better quality cottons to such an extent that it has had the effect of curtailing consumption.

For all practical purposes the cotton trade had always regarded the matter of character of the cotton in addition to its grade and staple length. Incorporating instrument measurements in the trading practice was, therefore, a means of better defining character properties of the cotton. Under our present system of marketing our government becomes a residual buyer of cotton through its price-supporting no-recourse loans.

Any cotton, which the trade is evaluating lower in relating it to its actual use value, will invariably find its way into the government loans, and consequently we are missing the very economic incentive in gearing our production to quality cotton. The producer may take the line of thought that it does not matter if the trade is the buyer or the government, as long as he has an assured outlet for his production. The fallacy of this type of thinking need hardly be elaborated upon, for we have seen the result of the accumulation of several years of overproduction for which there was no market. At some time this cotton must be sold, and it will be a drag on the market, and consequently depress the price of whatever you produce.

The producers of the West have shown a very far-sighted and intelligent view in their approach to the marketing of SuPima cotton. There are no direct comparisons to be made, for the nature of the extra long staple business is quite different from the way in which Upland cotton is handled. There are, however, parallels in merchandising of any commodity. If we are to be concerned with values, we must expect to prove such value in our marketing of Upland cotton, very much in the same manner as SuPima has attempted to show its superior value.

• **Must Produce Useable Fiber** — It is not enough to produce cotton as a textile fiber but rather we must produce a useable fiber. To find what is the useable fiber and which fiber is most in demand is a profitable field for research into supply and demand factors and price relationships between qualities of cotton. We had cotton produced in this country this season which, at the farm price level ranged from below to well above 40 cents per pound. These various qualities must of necessity go into different uses.

In asking for an acreage increase this year, the industry is reasoning that we have a scarcity of high grades, Strict Low Middling and above, of which the demand is at least 75 percent. A 25 percent of low grades, which by and large fall into the category of 10 cent to 25 cent cotton, is in a group by itself and should in our political and economic consideration be treated as such. When you are talking about El Paso Acala 1517 Good Middling 1-3/16" you are talking of a commodity different from the cotton that was recently selling as cheaply as eight cents, nine cents and 10 cents. How can we, under a political program which lumps all these qualities together in one pot, ever straighten out the economic quality values when all of it is treated as one total surplus?

The answer to these questions might very well lie in the manner in which we are reflecting the spinning values in our marketing system. This means that the government support loan must ultimately reflect these spinning values, and the support program must be based not upon grade and staple length alone. The loan schedules must give recognition to spinning values.

There are enough substitutes for cotton today on the market that the customer can find what he wants. As a matter of self-protection, the producers of cotton and the merchants who market the cotton for him must bring out *every* superior value that we can find in the cotton fiber.

We should take inventory of our capacity to produce the quality cottons which our customers require. The need for cotton for the bag trade and the workman's clothing industry is just as great as the need for cottons to go into the fine poplins. In the former the price is very important, where cheap volume production and harvesting methods would serve a purpose, and in the latter the matter of quality as well as promotion are by far the more important considerations.

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Significance of Improvements In Western Varieties

JOHN H. TURNER, Director, U.S. Cotton Field Station, Shafter, Calif.

The cotton breeding program at the Shafter Station is dedicated to maintaining and improving the varietal features for use in California's One-Variety District of Acala cotton. *Maintenance* is an obligation to be fulfilled each year. Varietal *improvements* require time and cannot be expected every year. Hence, a concentrated effort upon *specific* objectives is a necessity if further varietal advancements are to be forthcoming.

• **Earlier Maturity** — The economic significance of this objective for the San Joaquin Valley lies in the possibility of utilizing more of the clear days of fall weather to operate machine pickers. Machine harvest is not efficient until two-thirds of the bolls are open. Most years, the southern San Joaquin Vallen counties have 30 to 35 days of clear weather after fields have reached this stage of opening, whereas, northern counties have only 15 to 20 days. The first frost of November, followed by rains and fog, catches approximately 35 to 40 percent of the valley cotton in the field. A ten-day earlier starting date for machine harvesters could result in untold savings.

• **Superior Fiber Quality** — The wide range of textiles utilizing Acala 4-42 lint makes it imperative that any inherent changes be of the nature to satisfy these markets. Recent visits to the large volume consumers of raw cotton revealed their general satisfaction in processing California cotton. There were, however, three factors that practically all mills suggested should be improved; namely, (1) reduce the neppiness, (2) reduce the seed fragment trash, and (3) minimize the machinery damage to the fibers. The first two criticisms are being explored as part of breeding while the third is being studied from various research projects.

• **Additional Disease Resistance** — Verticillium wilt is the major disease in the San Joaquin Valley. A high degree of wilt tolerance in the variety has been the salvation to cotton growers since 1954. Even so, additional tolerance will be needed as the growers strive for yields beyond the two-bale-per-acre level. The extra boll load places a critical stress upon plant functions in late summer. This stress is intensified with fertilizer-irrigation practices that many growers employ in their attempt for high yield. Added tolerance may be possible through pyramiding the genes (or factors) contributing to resistance found in parents of several hybrids at Shafter. Beyond this emphasis for added tolerance is a longer range effort, where the backcross technique is being used to transfer supreme wilt resistance from Peruvian Tanguis.

Bacterial blight is becoming a disease we must recon with in the San Joaquin Valley. The increasing use of sprinkler systems for irrigation may speed the importance of incorporating resistance in the variety. Others, such as the "seedling" diseases, may be minimized or controlled by cultural means or chemical applications. Nevertheless, data from several Shafter studies indicate that the experimental strains with rapid emergence and extra seedling vigor would be a definite advantage.

• **Improved Plant Features**—The elimination or reduction of leaf and stem hair, and selection of less brittle bracts would reduce trash in machine harvesting. Shorter and less abundant seed fuzz would speed ginning by 10 to 20 percent. Harder seed at the basal end would reduce chipping by pickers and gin machinery. Elimination of long seed "tips" would reduce lint trash for the spinner. The reduction or absence of pigment glands in the seed embryo would result in higher quality cottonseed meal and oil. (Pigment glands carry the gossypol which makes the meal unsuited for poultry and swine feeding and also causes the oil to be discolored.)

• **Tolerance to Stress Conditions** — Cold tolerance, or the ability to withstand low springtime temperatures, is needed. Plant types with less sensitivity to irrigation would be an advancement; any way that California's vital resource, *water*, can be conserved is most important. "Salt" tolerance, or the ability to germinate, grow and fruit more efficiently on alkali soils is being sought.

• **Important Strains** — Our wealth of germ plasm includes many genetic lines,

strains and varieties. These introductions have been crossed with the Shafter Acalas. Selections from such populations have led to the development of four important strains of cotton.

Considerable promise is shown for varietal improvements within these developments. The four advanced strains must now receive wider testing and further exaluation to determine their value for the One-Variety program. Each of these strains consists of sublines, called families, that have shown varying degrees of the desirable features.

Cal 6-1-5 is probably the most uniform of these strains. This strain is superior to 4-42 for wilt tolerance, fiber strength and a finer fiber. It is doubtful as to whether any improvements for picking, and ginning or early maturity could be gained from this cotton. Yieldwise, it has shown no advantage and in most cases this strain has been five percent lower than 4-42. However, this is the most wilt tolerant among the advanced strains.

R15-7 is the second strain. Families of this strain are now in the seventh and eighth generation. They continue to segregate for fiber length and strength, with most families either shorter or weaker. However, one family has fiber length and strength equal to 4-42. Other characters are more stable. It is an early maturing cotton; approximately seven to nine days could be gained for machine pickers. Its' fiber has luster, is more mature and has a low nep potential. However, the most striking improvement in this strain is its rapid germination and excellent seedling vigor. Indications are that this trait may be partially "salt" tolerance. A 25 percent greater plant growth was measured for four-week old seedlings under Imperial Valley conditions than all other strains in 1955.

The time required to obtain 80 percent germination was reduced by two-thirds for R15-7 in comparison with 4-42 seed at high salt level, whereas, the time reduction was only one-third at the low salt concentration.

The third strain is known as Cal 7. It is now fifth generation material. The better families are four to seven days earlier than 4-42; some families have longer fiber and some families a fiber of luster and strength. It is questionable as to whether the better families have the essential wilt tolerance and yield. This superior fiber type is being used as a parent with many hybrids.

The fourth strain has the designation AXTE. This strain brings together eastern and western germ plasm in addition to the "man-made" tri-species for its parentage. Within the AXTE are 10 families. A composite of these families provided seed for intial yield trials in 1957. This strain has a possibility of one week earlier harvest. Definitely it could give improvements for seedling vigor, plant erectness, fruit setting efficiency, ease of harvest and faster ginning.

Considerable breeding attention must continue in order to stabilize its fiber properties, particularly strength and fiber length. Additional wilt tolerance is possible since some families, already highly tolerant, give segregates practically free of wilt. Its yield performance was excellent in 1957, but testing of the best all-around families is necessary before any conclusion can be drawn.

• **Glandless Cotton** — The recent development of glandless-seed lines has provided a new source-material for cotton breeding. By using the winter planting garden at Iguala, Mexico the applied breeding part of this work can be hastened. Theoretically, only one plant in 3,200 can be expected with glandlessness and four highly important traits combined. If undesirable plant or fiber traits are found to be linked with glandless seed it will be a time-consuming project. Another character being sought in the same manner is blight resistance. As other such features appear which are needful, they will be added to the breeding efforts by hybridizing with each of these major strains, so that any potential varietal improvement can be continually placed on the "assembly line."

The cotton plant is *stubborn*. We have faced this fact in many breeding endeavors. Smooth leaf strains have been selected—they are low yielding; some earlier strains that gave high yield were short staple; our highest fiber strength has been associated with wilt susceptibility. Nevertheless, it is apparent that some of these linkages have been broken in the development of these strains. The task now remains of stabilizing the improved features of the best families of each strain while testing goes ahead. Compositing of several superior families may become the final answer in providing future seed supplies resulting in varietal improvements.

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Soil Compaction Problems, Causes And Remedies

DR. WALLACE H. FULLER, Head, Department of Agricultural Chemistry and Soils, University of Arizona, Tucson.

There are two broad classes of soil compaction: "genetic"—compaction formed during the natural development of the soil—and "induced"—compaction formed by mechanical pressure of farm implements and by the weight of water. Corrective methods are often the same for the two classes, although correction of compaction does not lend itself to generalizations.

Soil may be rather uniformly compacted from the surface to lower depths or it may be compacted in layers. A compacted soil usually has an apparent density of about 50 percent more than in its natural state. It may be well for us to visualize a compacted soil as one which has apparent density sufficiently high to adversely influence crop production. (1) The pore space in compacted soil is greatly reduced and water penetration is slow or almost wholly retarded. (2) The size of soil aggregates or structures are reduced, particularly in the coarse range in soils where compaction has been induced. (3) Air movement has also been shown to be lower in compacted soils than in soils of good tilth. (4) Roots penetrate compacted soils to a limited extent or not at all. (5) The feeding area of the roots thus may be drastically reduced as a result of soil compaction. (6) The microbiological activity in a compact soil area is less than in well-aerated soil. In some Arizona soils microbiological activity has been so retarded that plant buried residues were found to be in a perfect state of preservation a year after plowing.

• **Causes of Soil Compaction** — Soil compaction has become a prominent factor in achieving maximum crop production with the recent intensification of farming. In the present stage of mechanization, the amount of traffic over farm land is great. The weight of this traffic over cultivated land has increased with time. There are several distinct types and degrees of compacted layers in soils, depending upon the implements used:

(1) Compaction caused by relatively light implements used for seedbed preparation, such as the disc and harrow. These compact a soil at a shallow depth of about three to four inches, depending upon the soil type and mechanical setting.

(2) Compaction caused by heavy machinery, such as a tractor, truck, or harvest equipment. The surface few inches are often drastically compacted by the heavy machinery, water penetration is materially affected, and soil structures are broken into smaller aggregates or even pulverized into single grain particles.

(3) Compaction caused by plowing. This results in the familiar plow-sole. The compact layer is deeper than that of the other two and will form at the base of the plow share.

(4) The vibration of machinery also accelerates compaction.

(5) Compaction caused by the weight and action of irrigation water. For example, an acre-foot of water weighs about 2,719,000 pounds.

(6) Compaction caused by the hoofs of cattle and sheep on intensively grazed land.

• **The Effect on Crops**—Growing of any crop under irrigated conditions will cause a certain amount of soil compaction. The usual production practices leave the soil in a condition that requires plowing or tilling in order to get a suitable seedbed. The first signs of compaction may be noticed during preplant irrigation. Water intake rate may be slow and irregular if a soil is compacted. For example, a silty clay loam in the Yuma Valley took water at an average rate of 0.46 inches per hour during the first hour when roughly tilled, but at only 0.09 inches per hour when excessively tilled.

The next critical period for establishing the extent of soil compaction is during the period of seedling emergence. Crusting of the surface soil is a form of compaction that often seriously reduces plant stand by preventing seedling emergence or possibly seed germination. Thinning of stand and skipping as a result of this form of compaction may be a large factor in crop production.

The presence of a plow sole or pressure pan as a result of tilling to a fixed depth, year after year, can cause considerable reduction in plant growth and yield.

Where land is sloping, compaction is conducive to accelerated erosion and water run-off. Various forms of soil compaction, therefore, may affect crop production per unit area in varying extents from slight to severe where no growth occurs. In general, soil compaction may affect crop growth and yield in the following ways: (1) Reduces root feeding area by the smaller pore space and the mechanical obstruction of pressure pans; (2) Reduce seed germination; (3) Prevent maximum emergence of seedlings; (4) Reduce the amount of water available to plants, and (5) Reduce aeration —roots require soil air to grow.

• **Corrective or Preventive Measures** — (1) Eliminate as much traffic with heavy implements as possible. (2) When tilling the soil, work it at the proper moisture content. Very wet soil compacts much more readily than dry soil. Breaking the soil when dry is the most important way of eliminating compact soil. (3) Break up the soil below the compacted layers where practical when preparing a seedbed. In Arizona two types of plows are used for breaking the soil, (a) a heavy disc plow and (b) heavy moldboard plow with hydraulic lifts. Plow the compacted layers where practical. (4) Deep plowing has helped remove compacted layers as well as eliminate horizontal zonations caused by different texture materials. (5) Knifing has been used to break up and lift compacted layers. It has less damaging influence on soil structure than plowing. (6) Chiseling is a process involving one or more teeth set at various depths for the purpose of breaking up compacted layers. It also has been effective in increasing water penetration and aeration.

Compacted soils should be broken when the soil is relatively dry to take advantage of the greatest possible shattering effect. These implements lose their effectiveness in wet soil. Use light tillage implements for seedbed preparation and cultivate as infrequently as possible. Also allow the soil to dry as thoroughly as possible and air before the preplanting irrigation.

The effectiveness of the method used to reduce or correct soil compaction will vary with the circumstance. Thus, certain precautions should be taken to select the correction procedure most suitable to the circumstance.

Return as much of the crop residues as possible. Burn only when disease is a factor in production. Organic residues should be worked into the soil as deeply as practical. Plowing under with a moldboard plow is considered as one of the most desirable methods of incorporation.

Rotate crops to prevent the formation of pressure pans in the same spots each year. Certain crops also are deep rooted; thus they are effective in improving water penetration and areation.

If it is necessary to pasture land for row crops, it is most desirable that the animals be allowed on the land only when it is dry. Animal hoofs can seriously "puddle" wet soil.

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Fertilizing-Irrigating Cotton for Greatest Possible Profits

DR. D. E. LONGENECKER, Agronomist, El Paso Valley Experiment Station, Ysleta, Texas.

High yields are the result of good control over fertility, moisture, soil physical conditions, diseases and insects, and the weather. The first four, with proper know-how, are subject to considerable control. The fifth is the most unpredictable and is not subject to control. Consistently high yields are obtained only by farmers who recognize that all of these main factors are highly interrelated.

Results of a great many fertilizer trials have shown that potash fertilizers are not needed for cotton in the Irrigated Southwest.

Research has shown that applications of phosphate to cotton in the Southwest fail to give a yield increase great enough to pay the fertilizer cost. Most Western soils contain considerable phosphate in available form. Also cotton does not have a high phosphate requirement. Application of phosphate to cotton is therefore not justified except perhaps under the following conditions—(1) where soils have not received phosphate for many years (2) on the coarse-textured soils of low fertility, sands and loamy sands, and (3) where high amounts of nitrogen and water are applied in efforts to obtain three-fourths bale cotton yields. There is some evidence to indicate that some phosphate is needed as a balancing nutrient when high rates of nitrogen and large amounts of water are applied.

• **Nitrogen** — Nitrogen is the chief

limiting fertilizer element for cotton throughout the Irrigated Southwest. Cotton usually gives an excellent yield response to nitrogen applications on all except perhaps certain heavier valley soils. Nitrogen should be applied to most irrigated cotton soils every year unless following a legume or other green manure crop.

Well-drained soils of lighter texture respond strongly to nitrogen applications. This is due to the fact that root aeration is adequate, root distribution is usually not restricted, and much of the nitrogen applied is leached out in the drainage waters before the plants can use it. For this reason, it is better to apply the nitrogen in several smaller applications spaced up until mid-summer, rather than in one application. A suitable arrangement would be to side-dress half of the nitrogen shortly after a stand is obtained, and apply the other half in several small portions in the early summer irrigations. This assures an adequate nitrogen supply during the most critical growth period, which is from emergence to mid-summer.

• **Water Application** — As the fertility level is increased, the point of maximum profit shifts in favor of heavier water application. Under low fertility, this point lies somewhere between 25 and 30 inches of water per acre. Under high fertility, maximum profit is obtained with somewhere around 40 inches of water.

Very often, under conditions of low fertility, excessive amounts of water are applied. This often results in greatly reduced yields, because the fertilizer elements are leached out and the cotton suffers from acute nutrient deficiency. High amounts of fertilizer are applied but not enough water is supplied to make most efficient use of the fertility. This situation often exists in dryland areas when rainfall is deficient.

The chief factor limiting yields on fine-textured soils is neither fertility nor lack of moisture, but adverse soil physical conditions—poorer drainage, a tendency of soils to become water-logged under too heavy irrigation, insufficient root aeration, and colder soil temperatures. Fine-textured soils also are high in natural fertility, and often do not show the marked response to nitrogen which is obtained on lighter soils. High nitrogen applications are not desirable on clays and clay loams, primarily because it is impossible to apply the higher amounts of water needed for optimum results without causing adverse effects such as water-logging and restricted root aeration. When this happens, yields are greatly reduced. Plant growth is greatly retarded, and excessive shedding of flowers, squares and young bolls occurs.

The key to successful farming of these finer-textured soils is moderation, particularly with respect to water and fertilizers. Emphasis needs to be placed on improvement of soil tilth and other soil physical limitations.

• **Fruiting** — The larger and stronger a cotton plant is, the greater number of bolls it can carry to maturity. The number of mature bolls per plant has been shown to be closely related to the total leaf area.

The cotton plant, particularly Acala varieties, has what is called an indeterminate fruiting habit—flowering and fruiting, once begun, are continued up until the time of frost. However, cotton also has a tendency to alternate in either vegetative growth or fruiting. Once fruiting has begun, the plant does not make much additional vegetative growth, unless thrown out of its fruiting cycle by rains, or by excessive water applications.

It is important, in striving for high yields, that the cotton plant grow as strong and tall as possible before fruiting begins. Emphasis, therefore, needs to be placed on getting the cotton up and off to a fast healthy start, and to push growth as much as possible before fruiting begins. This can be done by seeing to it that both moisture and fertility are plentiful from planting time to mid-summer.

In this connection, heavy preplanting irrigation is essential. The soil moisture reservoir should be filled to capacity to a depth of at least five feet. This often cannot be done during later irrigations without danger of water-logging and crop damage, particularly on slowly permeable soils. In the El Paso area, a heavy preplanting irrigation is desirable, also, in order to leach accumulated salts to a safe depth. In this area, soluble salt accumulations in the seedbed are a primary reason for reduced germination, slower emergence, poorer stands and a generally slower early start.

• **Do Not Plant Too Early**—Upland cotton probably should not be planted in this area before the middle of April. Later-planted cotton gets off to a faster start. Soils are warmer, seedling diseases

do less damage, and stands are better.

Side-dress with a good application of nitrogen soon after a stand is obtained. Do not irrigate again until sometime in June. The preplant irrigation should supply all the water needed by cotton until rapid growth begins about the middle of June. The practice of watering-back to aid in obtaining a stand often does more damage than good, particularly where waters contain appreciable amounts of salt.

During the heavy fruiting season in July and August, cotton should never suffer for water. On the lighter soils, irrigation water should probably be applied every 10 to 12 days. On clays and clay loams, every 16 to 18 days should be sufficient. A special effort should be made to keep the soils moist but not wet. Cotton thrives in moist soil—it does not thrive in wet soil. Late season irrigations, after Sept. 1 in this area, should probably be avoided unless the cotton is suffering. Late irrigations delay maturity and increase the amount of immature fibers.

It is essential, when aiming for high yields, that the cotton roots take full advantage of the soil profile to a depth of at least five feet. On loams and clay loams, which make up a large percentage of Rio Grande Valley soils, this can only be done if the soils are in good structural condition. The only way of obtaining and maintaining good structural conditions in these soils is to establish a good rotation and stick to it. The sweetclovers, Hubam, Madrid or the biennial types, and certain grasses, such as sweet sudan, are excellent for short period rotations. For longer rotations, alfalfa can hardly be excelled.

• **Boll Shed** — The Acala cottons grown in the Southwest are extremely sensitive to variations in light intensity. Temporary reductions in light intensity, caused by periods of cloudy or rainy weather during the fruiting season, are responsible for much of the shedding which sometimes happens. Heavy rains and cooler temperatures which often accompany these cloudy periods increase the amount of shedding. The cotton plant, taking in all the light energy it can during warm sunny weather, builds up a heavy load of flowers, squares and young bolls. When this light energy is suddenly cut off, the plants have to shed fruit to maintain a balance with the energy stored in the plant in the form of carbohydrates.

It is true we cannot yet control variations in the weather, but we can lessen the adverse effects, such as shedding, which occur as a result of bad weather.

First, the farmer should keep a sharp eye on weather forecasts during July and August. When forecasts indicate that cloudy or rainy weather is coming, he should hold off irrigations until he sees what is going to happen. Some of the most disastrous shedding occurs when rains and cloudy weather come just after an irrigation. This is primarily due to reductions in light intensity but is greatly increased when soils are saturated with water.

A good rotation also helps prevent excessive shedding by aiding water penetration and prevention of water-logging. Heavy, dense stands, which reduce the amount of light that each plant can obtain, should also be avoided. Plant spacings closer than every four to six inches in the row do not increase yields, and often accentuate shedding.

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Skip-Row Planting—Is It Profitable?

DR. ROBERT E. BRIGGS, Agronomist, Arizona Experiment Station, Tucson.

Skip-row planting is the practice of planting a particular number of rows; then, generally, four rows are skipped or left fallow. The most common method is four rows planted and four rows skipped. The practice of skip-row is fairly new and has been tried mainly since recent acreage controls in 1954. In areas where cotton is the main crop, the skip-row method has been attempted to increase yields and maintain production. Government regulations require no fewer than 13 feet four inches, or four 40-inch rows skipped, to allow this fallow area to be deducted for allotment. A cotton producer with an allotment of 50 acres using a plant four—skip four method would use 100 acres of land.

Various experiments have been reported on the yield increases resulting from skip-row planting. A study was begun in 1956 using the main variety, Acala 44, at the Cotton Research Center located near Phoenix and at the Yuma Experiment Station. Results indicated a 17 percent increase in yield at the Cotton Research Center by using the skip-row method, and a 40 percent increased yield at Yuma. In 1957, an expanded skip-row study was made using three varieties and two plant spacings. The varieties used were Acala 44, 44-WR, which is a wilt tolerant variety, and 124-68, an experimental line. With all three varieties, plant spacings of two and 18 inch intervals were tested. The studies included replicated four-row planted and four-row fallow plots and solid planted cotton, the four middle rows of which were harvested for yield.

• **Results** — The tests are again made at the Cotton Research Center and Yuma. The results at Yuma are shown in the table.

Results at the Cotton Research Center were similar to those at Yuma although with the close plant spacing, percent increase of yield of skip-row over solid was a little higher at Yuma with all varieties.

Considering the normal plant type when these three varieties are grown under the same conditions, 44-WR is the shortest of the three, A-44 is intermediate, and 124-68 is the tallest. Acala 44 and 44-WR yielded more lint per acre when planting at the two inch spacing with both the skip-row and solid planting method. The 124-68, however, had a greater yield of lint with both skip-row and solid when the plants were spaced at 18 inches. Results indicated that at the two inch spacing, the benefits of skip-row planting were greater where the cotton tended to grow quite rank. Observations of skip-row planting on light soils and at higher elevations have indicated that the advantage of skip-row planting does not appear to be as great as on heavier soils and lower elevations.

In a recent economic study, production costs using the skip-row method increased by 30 to 40 percent over solid planting. Major increased costs are from land preparation, water, maintenance of fallows, and insecticides and their application. To offset these increased production costs, it requires approximately a 20 percent increase in yield of skip-row over solid. If a grower were able to produce two bales with solid cotton, a 20 percent yield increase would mean approximately two and three-eighths bales on skip-row.

Variety	Plant Spacing	Yield Lbs. lint per acre Solid	Skip	% increase in yield Skip over Solid
44-WR	2"	1868	2193	18
44-WR	18"	1586	1842	16
A-44	2"	1772	2275	28
A-44	18"	1769	1946	10
124-68	2"	1412	1920	36
124-68	18"	1694	1984	17

When a profitable alternative crop is available and water is not scarce or costly, a grower's net return may be greater by growing solid planted cotton and another crop. Of course, if a grower has sufficient water and land, he may decide to plant skip-row cotton and other crops also.

In an apparent attempt to reduce the increased costs of land preparation and maintenance of fallows, the practice of interplanting another crop in the fallow strips has been observed. In an experiment at Yuma in 1956, soybeans were interplanted in the four-row fallow strips and there was no increase in yields of the skip-row over the solid planted cotton. Interplanted crops which are actively growing the same time as cotton appear to offer as much competition as other rows of cotton would.

• **Conclusions** — In conclusion: 1. Field experiments in Arizona have shown yield increases from skip-row planting to be as high as 40 percent over solid planting. Yield increases from skip-row planting appear to be greater where cotton tends to grow rank.

2. When water is available and at a reasonable cost, a cotton producer may get a greater net profit by growing a profitable alternative crop and planting the cotton solid. Again, if land is available, he may wish to use the skip-row method and plant the other crop separately. If water is scarce or costly, a grower may decide to use all his water with skip-row planting.

3. To answer the question "How Profitable is Skip-row Planting?" the key lies in how much increased yield a grower can obtain from skip-row planting over and above the increased production costs involved in the skip-row method.

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Beltwide Conference Dates Changed

The Beltwide Cotton Production Conference will be held at the Rice Hotel in Houston, Dec. 17-18, instead of December 18-19, as previously announced.

The Production Conference will be preceded by a meeting of federal-state entomologists on cotton insect control, Dec. 14-16; a joint meeting of the Cotton Improvement Conference and Cotton Disease Council, Dec. 15-16; and the Defoliation Conference, Dec. 16.

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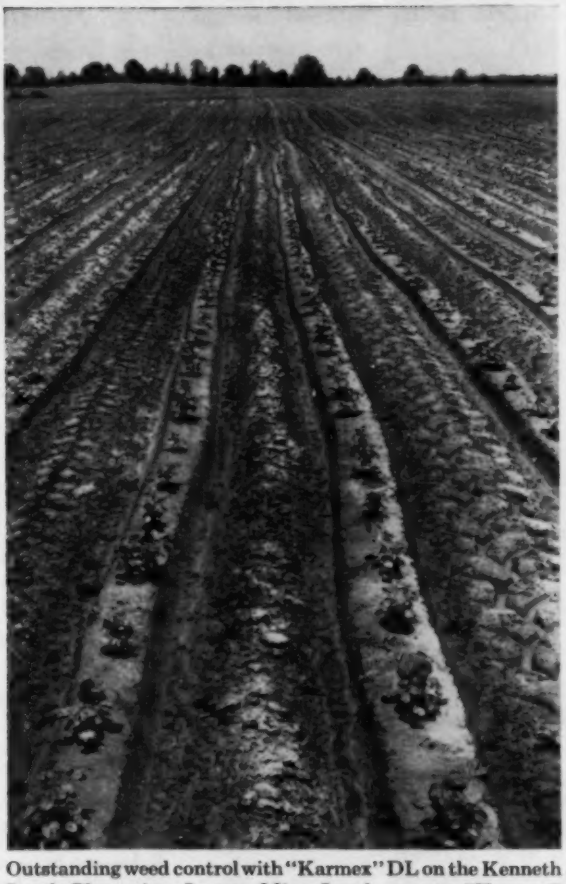

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A Symposium

Cotton Disease Control

Seedling Diseases

DR. PHILIP J. LEYENDECKER, Head, Department of Agricultural Services, New Mexico A&M College, State College.

Seed treatment chemicals have been designed to destroy disease producing fungi on the seed and protect the seed from rotting under unfavorable conditions for germination. Seed protection allows for good germination and the developing seedlings are usually more vigorous and in some instances can withstand mild attacks of soil fungi. Seed treatment was not designed to protect the young seedlings as they push through the soil and after they have emerged. Failure of stands after and during emergence should not be blamed on the inefficiency of seed treatment. Seed treatment alone will not insure and maintain a perfect stand.

Chemicals, such as Ceresan, Panogen, Captan, and Dow 9B, will do a good job of seed decontamination and protection, but other means of control are also necessary to protect the young seedlings as they push through the soil and become established before corky stem layers are formed which resist fungus attack.

In the last five or six years federal, state and commercial cotton pathologist have been devoting much time and effort to this problem. Basically the idea is to place a band of disease-free soil over and around the seed at planting time to insure protection for the developing seedlings. This presents a twofold problem. First, we must have inexpensive chemicals which are capable, under field conditions, of destroying disease-producing fungi in the soil. Secondly, a practicable way of applying the chemicals is needed to place the band properly over the seed.

• **Chemicals** — The following chemicals and combinations have proven very successful in controlling seedling diseases. Dithane D-14 plus zinc sulphate or Dithane Z 78; both formulations are also known as NABAM. D-14 is applied as a spray and Z 78 may be applied either as a spray or dust. D-14 mixed with zinc sulphate is considerably cheaper than Dithane Z 78 and for that reason is preferred. No differences have been found in the effectiveness of the two formulations. Dithane has been one of the chemicals used to treat over 100,000 acres in California last year. The results in some instances have been erratic but it has been mostly attributed to poor placement of the chemical over the seed.

Terraclor or PCNB applied as a dust or spray has given good results where *Rhizoctonia* is the main pathogen. Considerable commercial acreages in California, Arizona, and Texas have been treated with this material in the last few years. If *Phythium* and other fungi are also a problem mixtures of Terraclor with other fungicides are necessary for control.

The following mixtures have given very good control in Texas and California when applied as a spray or dust. (1) Captan, Zineb, and Terraclor, (2) Captan, Terraclor and Ceresan 200, (3) Terraclor and Phygon. Other chemicals and mixtures are being constantly tested but at present the preceeding have given the most consistent results.

• **Placement and Application**—If a fungicide treatment is to be effective the chemical must be evenly mixed with the soil from the seed level to the surface of the soil in a band three-quarters to two inches wide. The success of this operation determines the value of the in-furrow treatment since the chemical must destroy the disease producing organisms in the area through which the young seedlings must grow. Work has shown that a satisfactory distribution pattern can be obtained with special equipment designed to apply the chemicals either in a spray or dust form.

Best results have been obtained with sprays when a double nozzle arrangement is used which delivers about 10 gallons of water to the acre. A low pressure power take-off driven nylon roller insecticide sprayer which develops 35-40 pounds pressure can be readily adapted for this operation. The first nozzle should be centered on the furrow so that the spray strikes the soil around the seed. The rear nozzle should spray all the soil as it falls into the seed furrow and a small fraction of the cone should strike the top of the covered furrow.

The front nozzle is usually placed one and one-half to three inches above the original soil surface and the rear nozzle is directed so as to spray all of the soil falling into the furrow. Both soluble and wettable fungicides can be used, however, if wettable powders are used an agitator which can be constructed very economically should be installed in the sprayer system. All early dust application equipment was very unsatisfactory because a high air velocity was needed in the delivery tubes along with an attachment that produced a low velocity at the outlets.

If a seed press wheel is desired a special "Y" arrangement for the distribution of the fungicide can be obtained. The dust is applied simultaneously through the seed drop tube and the special dust attachment which is mounted directly behind the press wheel.

The correct chemical may be used and the equipment operating perfectly yet the entire operation can be unsatisfactory if the seedbed covering devices are improperly adjusted.

In-furrow application of fungicides for the control of seedling diseases has come a long way since 1953. Numerous fungicides and combinations have proven successful in controlling seedling diseases. Methods of application have been perfected to insure placement of a treated band of soil over the developing seedlings. More is to be learned about in-furrow control but it appears that we are well on our way to controlling seedling diseases which will produce good stands.

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Nematodes

HAROLD W. LEMBRIGHT, Nematologist, The Dow Chemical Co., San Francisco.

We can expect nematodes to become a more serious problem each year in the West. There may be temporary setbacks to the expansion of the problem, but in general you may expect the problem to increase.

Eradication appears far out of the realm of practicality, and so we must learn to live with the problem. This means crop rotations, fallowing, soil fumigation and combinations of these three. Cotton breeding is a possibility. The Acala varieties offer some but not sufficient resistance. Pima varieties are extremely susceptible.

• **Soil Fumigation** — Soil fumigation is considered by some to be a costly approach, whereas in reality this seldom is the case. The economics of the overall production program of the farmer must be considered. Crop rotations, or fallowing, as single considerations for control are generally uneconomical as compared with soil fumigation in conjunction with cotton production.

Root-knot nematodes can cause very serious economic damage to cotton, sometimes reducing yields one-half or more of the crop potential. Greater reductions are generally due to other factors, such as improper irrigation or fertilization, insects, diseases, etc.

Cost of treatment may range between $11 and $15 per acre for row placement. This means that a grower with only a light infestation can still afford treatment, and expect a $37.50 return from $15 invested as a result of a one-fourth bale increase. There are additional returns and costs because of the improved production, but even with these he should get back at least two dollars for every dollar invested. On a severe infestation it would be $15 invested against a $112.50 return. This amounts to a return of over six dollars for every dollar invested, using maximum costs and maximum returns.

Other economic considerations of the problem are water and fertilizer. Indications are that on cotton with a severe nematode infection, fumigated land will reduce the water requirement of the cotton by almost one-half, and less for lighter infestations. In irrigated areas this amounts to both savings and water conservation, which is very important in areas with water deficits. The same applies to fertilizers. It has not been uncommon to see a grower over-irrigate and over-fertilize in an attempt to overcome the setback of nematodes. Soil fumigation will not reduce general water and fertilizer needs. Instead, it will maintain them at normal levels.

Without soil fumigation, rotation, or fallowing, next year's nematode infestation is likely to be worse than this year's; also, if one shifts from Acala with a light infestation to Pima it may be severe on Pima.

With a light to moderate infestation, row placement is the practical method of control; with a severe infestation, row placement is cheaper, but complete coverage will generally return more to the grower. Row placement is the general practice on cotton, regardless of the degree of infestation. Assuming the grower is interested in making the maximum profit from his cotton crop, more

consideration should be given to using complete coverage in cases of severe infestation.

The severely infected plant generally appears as one suffering from lack of fertilizer and water. If you dig up the plant you will find small galls (swellings) on the roots.

There are three fumigants in general use: The dichloropropene type; ethylene dibromide formulations; and the dibromochloropropane type. All three types of fumigants have utility on cotton.

For soil fumigation to be practical the grower should follow a good farming program. This includes using recommended amounts of fertilizer, a recommended irrigation program, good weed, insect and disease control programs, and other accepted good farming practices. Controlling nematodes is only one of the limiting factors in crop production, and controlling nematodes without these other practices is generally considered a poor investment.

Recognition of the problem is best done during the summer or fall and prior to harvest. The pattern of nematode severity usually develops according to soil type; the sandier the soil, the more rapid the buildup. Thus, an infested field has usually considerable variation in plant height. These stunted areas are points to check first for galled cotton roots. However, it is well to check all fields, particularly those where the yields have been declining.

Having determined which fields have an infestation, it is well to make some decision as to what will be done with the field next year. If it is to be planted to cotton or some other susceptible crop, it is well to place these infested fields on the early picking schedule.

• **Land Preparation — Winter** — Cotton trash reduces the effectiveness of the fumigant by reason of poor penetration of undecomposed roots and galls, as well as other physical effects. The trash hangs up on the injection chisels; the trash itself causes air pockets, preventing good distribution of the fumigant and causing it to escape too rapidly from the soil. The addition of nitrogen fertilizer will often assist in the decomposition of this trash. Also, early and good decomposition of trash reduces the carryover of insect numbers.

The next step is preparation of the land for irrigation. As soon as the soil is sufficiently dry to permit a tractor to work the beds, it should be dry enough to fumigate.

• **Soil Fumigation:** With a satisfactory soil fumigation rig the fumigant should be injected into the bed so that it is about six to eight inches below the expected top of the bed at the time of planting. If the fumigant is applied for complete coverage, normally the soil will be worked flat and injected about eight inches deep on 10 to 12 inch centers. Follow the injection chisels with a cultipacker type of rig, preferably the loose ring type. This seals the surface sufficiently to slow the diffusion and effect good nema control in the surface layers, particularly if the surface is slightly moist. Also, fumigation can be applied earlier if trash and moisture are not limiting factors.

• **Waiting Interval** — Normally one to two weeks is best, depending upon the fumigant. In practice many growers appear to be able to plant with a shorter interval. However, under certain conditions the fumigant can display phytotoxicity with the shortened interval.

If soil fumigation is done early in the season and soil temperatures are below 50° F., the dichloropropene type would be preferred. If the soil is excessively wet the EDB type may be preferable, or if on the verge of being too dry, the dichloropropene and dibromochloropropane types would be best suited. In the case of dibromochloropropane, the selection of the proper dosage is important since this material is more residual and, when used in excess, may cause some temporary retardation of plant growth. The practice of side-dressing cotton with this material is under investigation, but to date the results have not been too satisfactory. If a field needs to be fumigated the wisest investment is application before planting.

Good soil tilth permits the fumigant to display its greatest effectiveness. Compacted soils generally restrict fumigant diffusion, therefore, subsoiling or chiseling should be encouraged.

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Verticillium Wilt

DR. JOHN E. CHILTON, Plant Pathologist, Arizona Fertilizers, Inc., Phoenix.

The characteristic symptom of Verticillium wilt is a mottled yellowing of the leaves, then later, a week or more, the defoliation of these leaves due to killing of the leaf tissue. Inside the stem and roots of these infected plants is a tobacco-brown streaking as compared with the white wood of healthy plants.

The Verticillium wilt fungus, which in culture is composed of minute, thread-like strands, exists in the soil with other organisms. It apparently does not grow to any extent but remains in a resting condition. This stage of the fungus is known as the sclerotial stage.

By some process a small strand emerges from one, or perhaps several fungus cells, and grows through the soil for short distances. It manages to penetrate the root of the cotton plant, directly through the walls, through the tender growing point or root hair, or through natural or other wounds. We are not sure just which method is correct. However, once in the plant, the hyphae branches and grows up through the water tubes of the growing cells of the plant. Then, partially by plugging up these water tubes, and by still unknown chemical processes, the fungus kills the leaves.

These leaves, and the roots and stalks, are returned to the soil. The fungus, meanwhile, grows into the black resistant sclerotia inside the woody parts, and as the wood decays, they are released into the soil.

• **Control Methods** — We may be able to interfere with this process in order to control the disease. When the strand grows out of the resting body, it appears to be very vulnerable and this is utilized in our recommended control methods. We do not know what factors start the strand growing, but it probably is a combination of temperature and moisture, and chemicals dissolved in the water. We assume that all fungus cells do not germinate at once or control would be very easy. This fact hinders the use of a chemical fungicide. If we had a chemical that would remain in the soil all season, we could have a very good control.

If the strand does not find a host to invade, it is doomed to death. It does not have the ability to grow on dead materials in the soil. Thus we recommend rotation programs on your farms. During a season of fallow or grain, or other non-susceptible plants, many of these cells germinate and die, thus reducing the number to invade a subsequent cotton crop.

At State College, N.M., barley was rotated with cotton. In several such tests, the cotton following barley has shown less severe wilt and yield increases of about 20 percent over continuous cotton. This same type of response has also occurred with rotations of cantaloupe, sweet clover, Hubam clover, alfalfa and dry fallow.

What are the possibilities of killing the resting body or preventing germination of the infection strand? Killing it is rather easily done by chemical fumigation, but hardly at an economical price for the cotton farmer. Chloropicrin is a very lethal fumigating chemical which has been used commercially to control Verticillium wilt in such high income crops as chrysanthemums and strawberries. The standard rate used on these crops is 35 gallons per acre, at a cost of $400 or more.

Newer experiments were started this past year in New Mexico comparing lower rates of the chemical. At 16 gallons per acre the increase of the treated was 1,690 pounds of seed cotton per acre over the untreated. Even row treatment of 10 gallons per acre partially controlled wilt with an increase of 700 pounds of seed cotton over the check plot. If any of this control can be carried over into the second year we shall at least be within striking distance of economic use of this chemical.

In addition to the wilt sclerotia in the soil, a multitude of other organisms exist. Some of these organisms produce chemicals, the antibiotics, which may kill or inhibite germination of the sclerotia, or they might parasitize the sclerotia. With adequate study, I look forward to the time when we can control this soil microbiology, thus utilizing the biological interaction to reduce the wilt inoculum in the soil.

When we look inside the plant infected with Verticillium wilt we see fungus strands, the hypae, growing throughout the woody portion of the plant. We can actually do several things to reduce the effect of this on the plant, or stop its growth altogether.

• **Control by Soil Temperature** — High soil temperatures are known to be unfavorable to the development of Verticillium wilt. This may be partly due to preventing the germination of the sclerotia, but is largely due to creating unfavorable conditions within the plant. Therefore anything we can do to increase soil temperatures will reduce wilt losses.

First of all, over-irrigation must be stopped. As moisture increases, wilt increases. This is probably due to the lowered temperatures induced in the plants by the water. Naturally in the field you can reach a point where water shortage is hurting your crop more than wilt.

Certain modifications of the soil can be made to increase temperatures. Plant-

ing on and maintaining high seedbeds to prevent water from flooding the plants will help. Double-row beds with extra deep furrows have been experimentally shown to decrease the amount of wilt over flat flood or single bed culture.

The relationship between the fungus in the plant and the plant itself is rather delicate. We have known for some time that modifying the growth of the plant in certain ways can make quite a change in the severity of wilt. For instance, when flower buds were removed daily from cotton plants, the rate of wilt development did not change but the severity of wilt was greatly reduced. In addition, there appears to be a correlation between the earliness of cotton strains and the susceptibility.

For several years the plant pathologists have found that closer spacing of plants invariably increases the yields of cotton on wilt land. The plants in the closely spaced plots do not branch as much as those in widely spaced plots, and they grow slightly taller. Maturity is delayed to some extent, and actual measurements have shown that the closely spaced plants produce only half the bolls per plant as the widely spaced. So we have actually modified the growth habit of the plant, making it less susceptible to wilt damage.

All breeding strains compared at different spacings in New Mexico show reduced wilt and increased yield at closer spacing. However, the more tolerant the strain, the less the induced tolerance associated with spacing.

To further combat the fungus within the plant, chemicals are being evaluated for their systemic action. Such chemicals, which enter the plant, might interrupt enzymic systems, counter toxic chemicals produced by the fungus, or work by other methods.

Scientists are continually searching for more and better sources of resistance to Verticillium, and the improvement of varieties should continue from year to year.

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Promising Leads In Control of Cotton Fruiting

DR. V. T. WALHOOD, Plant Physiologist, U.S. Cotton Field Station, Shafter, Calif.

Cotton is an indeterminate plant. This means that once flowering begins during the growth of the plant, it not only has to grow vegetatively, but must develop bolls and new flowers at the same time. By the time 20 days of blooming have passed, the matured part of the plant must maintain the complicated vegetative-fruiting balance. After 20 days of fruiting, the continuation of vegetative and young square development is in competition with older bolls which are drawing heavily on carbohydrate and nitrogenous materials. Also, the increasing number of young bolls that are set daily heavily taxes the total growth-regulating processes. An upset of the growth balance during this early fruiting stage can result in overloaded plants that cease all growth and are completely cut-out after 30 days of bloom.

Another upset would be when heavy shedding occurs, with all growth going vegetative and a resultant field of lodged "fodder"—again, quite a common occurrence. This indeterminate type of growth—simultaneous development of new leaves and young bolls and old bolls—as it is in cotton, is in contrast with determinate growing plants like barley, where the growth is generally step-wise in that today it is purely vegetative and tomorrow all growth is directed toward the head; or, like growth in fruit trees, where first, all the flowers appear then all the fruit develops as a unit.

Limited success has been achieved by a chemical in setting more bolls with a subsequent increase in yield. A compound called n-meta-tolyl naphyl phthalamic acid, with the commercial name, Duraset 20W, during three years of small scale tests in the Imperial Valley has given increases in yield of one-tenth to one-half bales per acre.

Yield decreases as well as increases resulted from applications that were quite comparable. There have been differences in application that may account for varying results. Some applications have been sprayed on at a rate of 25 gallons of water while other applications have been sprayed on with 50-60 gallons of water. The action of this chemical in increasing the yield, through prevention of boll shed, flower shed or square shed, has not been determined; however, in particular plots where yield increases occurred, detailed tagging indicated that reduced square shedding 10-14 days after application of chemical was consistent with increased yields. But, here again, there were no consistent yield responses to the chemical.

• **Gibberellins** — In 1957, a number of applications of gibberellins were sprayed on field-grown cotton at Shafter.

At first, it appeared that the gibberellins are not effective in controlling shedding since there was no increase in yield. This, however, may be due to a faulty type of application since very high rates of retention were obtained.

This chemical is unique in that it is the first chemical that has demonstrated the property of setting practically every treated boll. Since very small amounts have a positive action in setting bolls it warrants extensive studies to make it commercially applicable.

The technique used in the application of the growth regulators consisted of using one-day-old flowers. The corolla of a one-day-old flower was removed, leaving the young boll in the cup-like calyx. Into this cup-like calyx, 0.25cc of the desired acqueous solutions were applied with the aid of a hypodermic syringe. In this manner, the desired solutions were in close proximity to the young fruit with no injury to the boll. The effects of the growth regulators were measured by tagging the treated one-day-old bolls and subsequently recording their retention.

The effects of varying the concentrations indicate gibberellin responses are detectable at one ppm, (parts per million), with increases in retentions as the concentration increases above one ppm. In this and other studies, maximum retentions were obtained at the 100 ppm concentration. The gibberellins reversed, or stopped, boll abscission processes that had proceeded for four days. The abscission processes occurring the first two days were more easily prevented from proceeding than the processes continuing after two days. The boll setting properties of gibberellins negate the shedding caused by (young) boll loads and also show that there are shedding processes due to other factors than boll load and the gibberellin response. On Sept. 4, after 12 consecutive days of increased retention by gibberellins, the retention was as high as a Sept. 4 application not preceded by the induced high retention.

Following applications of gibberellins to the bolls, there was an increase in boll diameters up to 26 percent above the checks after six days. After this, the increase was reduced to six percent on 20-day-old bolls. On the premise that abscission of the bolls was reduced by an increase in the production of the natural auxin, indoleactic acid (IAA), with the increase in growth mentioned above, IAA was applied in the same manner as the gibberellins. The two were applied alone and together. An application of 100 ppm IAA increased boll shedding. The increase in boll shedding by IAA was readily blocked in the presence of applied gibberellins. One ppm gibberellins increased boll retention from 11 on the checks up to 22 percent; 100 ppm IAA reduced retention from 11 on the checks to one percent; one ppm gibberellins plus 100 ppm IAA together did not change the retention from that of the untreated bolls, the treatments retaining 15 and 11 percent respectively. Gibberellins were up to 100 times as effective in retarding boll abscission as IAA was in promoting boll abscission.

The average weight of the matured bolls treated individually with gibberellins was less than the weight of non-treated bolls. This probably was due to the large number of smaller and lesser-seeded bolls induced to be retained by the gibberellins. In other studies, during periods of little or no retention of the check plants, large numbers of bolls set by the gibberellins were produced without pollination; such bolls eventually opened, devoid of seeds.

The application of gibberellins to the apical buds of cotton plants in all stages of cut-out was followed by an immediate resumption of growth. In both cut-out and growing plants, the rate of new nodes produced was the same but the added length was greatest in plants still growing when the gibberellins were applied.

Research has demonstrated the practicability of controlling fruiting by increasing yields in the Imperial Valley with the use of Duraset. It has also demonstrated that the gibberellins CAN be extremely effective in controlling fruiting. At least, we have the opportunity to test whether it will be feasible to put more bolls on the plant than it normally produces.

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New Developments With Systemic Insecticides

DR. H. T. REYNOLDS, Entomologist, California Experiment Station, Riverside.

Everybody who is acquainted with irrigated cotton realizes the problems involved with obtaining underleaf coverage with insecticides on tall cotton. The use of systemics, such as Systox, solved this problem because of their ability to penetrate the leaf, and by moving in the plant sap, killed the mites on the lower

leaf surface. Systox has been an exceedingly useful development in all cotton areas. It is particularly useful in the San Joaquin cotton growing area of California, where growers are plagued with three different species of mites.

During the summer of 1956, reports of failures of Systox to successfully kill mites were received in increasing numbers. When checked carefully in the laboratory, it was found that a resistance to Systox had developed in three cotton areas of California. Apparently this had happened in three widely separated areas of the state and in each case a different kind of spider mite was involved. This has many profound ramifications because, once resistance is established, it is inherited and lost slowly if at all.

Futhermore, many of our insecticides are related chemically and resistance to one chemical extends to related compounds. Systox is an organic phosphorous compound, and resistance was found to extend to related compounds. Some of the new and highly promising compounds not effective on resistant spider mites are Trithion, Tetram, Nialate, Delnav, and parathion. Materials which are not organic phosphorous compounds and, therefore, still effective, are sulfur, aramite, and Kelthane.

• **New Systemic Materials** — In the last few years much of interest has developed in two new systemic materials, Thimet and Di-Syston (Bayer 19639). The compounds have been investigated largely as seed treatments, or granulated formulations applied at time of planting. These compounds are effective in killing a broad range of pests affecting seedling cotton plants. Some of the seedling pests reported to be susceptible include; aphids, spider mites, thrips, leaf miners, flea beetles, light infestations of cutworms, and leafhoppers. When tested for control of overwintering bollweevils and fleahoppers, results were not particularly promising.

Thimet and Di-Syston are close relatives chemically and results with the two have been quite similar in the field. Against aphids, spider mites, and thrips they remain effective for a period of four to seven weeks after planting. Some reports indicate Di-Syston lasts somewhat longer than Thimet. Unquestionable, Thimet is more effective on flea beetles and Di-Syston remains effective longer on aphids.

Granulated formulations placed in the seed furrow have given approximately the same results as a similar amount of toxicant put on the seed. When granulated formulations are side dressed into the soil, as are fertilizers, results have not been particularly promising. Radiotracer work shows that less than one percent of what it put into the soil gets into the plant.

Entomologists have long talked about the possibilities of insecticides which can be put on seed or in soil and which will then move into the plant and kill insects feeding thereon. This dream has become partially fulfilled on cotton but like other new developments this type of use has many problems. Treated seed flows through a planter at a reduced rate compared to untreated seed. Compensation for this can be made easily by recalibrating the planter. Better adhesives are needed to stick the material onto the seed. To date methyl cellulose has been used primarily, but more desirable ones are under investigation.

One of the major problems has been that of reduced germination when treated seed is planted in the field. Impaired germination occurs primarily when planting takes place during or is followed by cool and damp weather. Retarded germination gives soil organisms a better chance to attack seed.

• **Fungi Problems** — Two soil fungi are of primary importance in California, insofar as germination is concerned. These are Pythium and Rhizoctonia. Thimet was found to be quite an effective fungicide in control of Rhizoctonia which causes "sore shin" of cotton. However, it was found that Thimet had no effect on Pythium. Although seed coatings of Ceresan 200 or Panagen, used alone, controlled Pythium, when a Thimet seed coating was put on top, the fungicidal action was lost. Thus, it was concluded that in some way the Thimet or activated charcoal carrier of Thimet in some manner inactivated these mercurial fungicides.

It was found that activated charcoal and another equally absorptive carrier caused almost as much inactivation as when Thimet was included, but inactivation was a little more severe in the presence of Thimet. The inactivation was apparent only when the seed germination was slowed up by "incubating" the planted seed at around 60 to 61° F. for about six days. At 70° F. good germination occurred; probably the plants emerged quickly enough that the Pythium did not have a chance to kill the seed. Currently other fungicides are under investigation. To date Captan has given satisfactory results when either put on the seed as a coating or when mixed with the Thimet seed coating.

A very real problem is whether treated seed is going to pay dividends to the grower. This is a preventative type treatment. You do not know whether you are going to have a problem with seedling pests when you plant treated seed —you are gambling. If a problem does not arise, not only have you wasted money, but you have exposed sub-economic pest populations to insecticides needlessly. In all likelihood, therefore, you are increasing or hastening the development of insecticide resistance without cause. This may be more important than wasting money.

Research has shown that there is no loss in lint quality following seed treatment, but reports have been variable as to yield. Many reports have indicated some loss in yield in the absence of insect pests, but in the presence of heavy infestations of seedling pests some gain have been reported. Others have reported no gain even when pests are present.

Each state or cotton growing area must weigh its own problem, based on experimental evidence, insofar as recommending seed treatment is concerned. In California we do not recommend seed treatment although we realize some growers will use it. Few of our fields need insecticidal treatment in the seedling stage of growth. Cutworms are probably our most serious seedling problem and, as indicated, Thimet or Di-Syston seed treatment may not kill cutworms fast enough to protect the stand under moderate or heavy attack. With the long growing season in California, thrips control does not increase yield. In California, the few fields that need insecticide in the seedling stage of growth are better off to use chemicals when the need arises.

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Research Results On Non-Systemic Insecticides

DR. J. C. GAINES, Head, Department of Entomology, Texas A&M College, College Station.

Research entomologists have found that one or two cone-type nozzles per row placed six to nine inches above the tops of plants are sufficient for the control of insects in the early part of the growing season. Nozzle spacings of 20 inches on the boom are adequate for the control of insects late in the season. With ground machines, sprays should be applied at approximately 60 pounds pressure and at two to eight gallons per acre. With airplanes, the dosages should be increased over that used in ground machines by at least 50 percent in early-season applications, while the dosages generally recommended for ground machines are adequate for late-season control. The sprays should be applied at two to two and one-half gallons per acre, except in West Texas where three to four gallons per acre may be needed. In Western States higher rates and gallonages per acre are recommended. The swaths should be flagged to insure thorough coverage of all plants.

Results of experiments in some states indicate that the control of insects attacking cotton early in the season is profitable. This reduces populations of insects, protecting the young fruit, which allows the plants to produce a full bottom crop. A high percentage of the squares on the lower half of the plant will produce bolls if protected from insects, while a high percentage of the squares produced on the top half of the plant will shed. The protection of early squares insures the grower early fruiting, early maturity and better quality.

• **Insect Resistance** — Resistance (heritable and nonseasonal) to an insecticide is present in an insect population which consistently shows a greater survival when subjected to repeated exposures to a chemical than was noted when the chemical was first used for controlling the species. Resistance in cotton pests was first observed in the cotton leafworm. This was followed by insecticidal resistance in the salt-marsh caterpillar, cabbage looper, boll weevil and certain species of spider mites. Also, in some areas the cotton aphid, beet armyworm, cotton leaf perforator and lygus bugs are becoming increasingly more difficult to control with the chlorinated hydrocarbons.

Until recent years the cabbage looper attacked cotton sporadically but rarely caused widespread injury. When DDT first became available it was very effective in controlling the looper on vegetables and cotton; now this insecticide is considered ineffective in certain areas. This insect has become progressively more injurious to irrigated cotton in certain areas and appears to be resistant to all the chlorinated hydrocarbons. The small loopers can be controlled with toxaphene, toxaphene-DDT or endrin, but the larger worms are very difficult to control with any known insecticide.

Unfortunately, the presently available

phosphates have not proved effective for cabbage looper control. Some planters have used mixtures of phosphate and chlorinated hydrocarbon insecticides even though results of research indicate that the addition of a phosphate insecticide does not increase the degree of control. In some instances these mixtures have apparently created an environment favorable for bollworm and spider mite population increases. In such fields the mites proved very difficult to control with a phosphate insecticide and aramite was used to an advantage in combating this pest. In other words, low dosages of certain phosphate insecticides in continuous applications may prove rather expensive.

The cotton leaf perforator is at times a serious pest of cotton in the Western States. Mixtures of parathion or malathion in DDT and toxaphene are relied upon for the control of this pest. Fields should be examined regularly for bollworms and mites which may develop following applications of these mixtures.

• **Potential Threat** — The bollworm is a potential threat to cotton in the Western cotton-producing areas. DDT, toxaphene-DDT and endrin are still considered the most effective insecticides for the control of this pest. In the Far West, high dosages (two to two and one-half pounds per acre) are necessary to effect control, while in Texas a lower dosage (one to one and one-half pounds per acre) applied at five-day intervals as long as eggs and small worms persist has proven effective. Many growers have found that toxaphene-DDT mixtures are effective for most of the injurious insect pests of cotton.

Several species of lygus bugs and other mirids cause damage to cotton, thus constituting a major problem particularly in the vicinity of alfalfa fields. Some planters encountered trouble in controlling lygus bugs last year. It is believed that these failures were due to population pressure, and that better control will be obtained if applications of the recommended insecticides are initiated before the population develops to injurious numbers.

A number of species of spider mites attack cotton, and their reaction to acaricides differs greatly. Therefore, it is important that a grower obtain accurate identification of the species affecting his crop before applying chemicals for control. Demeton, parathion and aramite are considered the most effective acaricides. In some areas parathion cannot be relied upon to control certain species of mites.

• **New Insecticides** — Several new phosphate insecticides showed considerable promise in field tests during the 1957 growing season. Diazinon appeared promising for the control of certain species of mites, aphids, leafhoppers and leaf perforators at dosages between one-eighth to one-half pound per acre. Dicapthon was effective for the control of boll weevils and cotton aphids. Monsanto compound 7769 was also found to be effective for the control of boll weevils and certain species of mites. Delnav, Nialate, tetram and trithion showed promise for the control of mites in field tests. Additional research will determine the value of these new compounds in a cotton pest control program.

Another new compound, Sevin, a carbonate, was used as a dust in field tests in a number of states and was found to be effective for the control of such insects as boll weevil, bollworm, pink bollworm, thrips, cotton fleahoppers and cotton leafworms at dosages of 0.5 to two pounds per acre. This compound has interested entomologists because it is neither a phosphate nor a chlorinated hydrocarbon and may be needed to control certain insects which develop resistance to the insecticides now being used. Additional tests may show that Sevin is effective for the control of other insects injurious to cotton in Western areas.

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My Experience With Modern Insect Control

HORTON C. MILLER, Farmer, Canutillo, Texas.

Since the early 1940's, the harmful insect population has shown a steady increase in this Southwestern area. This increase probably is due to an imbalance between harmful and beneficial insects, climate and perhaps migration of certain types, such as the pink bollworm and yellow clover aphid.

Our first problem is to keep watch over our field crops for early signs of harmful insects. An imbalance is determined by actual count of both beneficial and harmful insects. When the harmful population reaches the borderline and damage is apparent, a suitable insecticide is applied. After insects are classified, and the insecticide and timing determined, get the insecticide on immediately. By delay, crops are further damaged far in excess of cost of insecticide and application.

Knowing the incubation periods and emergence times of harmful insects is of utmost importance in the timing and application of insecticides. By knowing the incubation periods and cycles of insects, whether beneficial or harmful insects, we are able to get more effective timing and better results. The pink bollworm cycle is about 12 days and effective controls are applied every seven days.

All insects are carried over from year to year in one form or another. A good practice is to have a brush cover area for the carry-over of ladybirds and other beneficial insects. But this may also act as a hibernation shelter for harmful insects. It is essential to destroy cotton plant residues to control pink bollworm larvae. However, where winters are severe, it is a good practice to leave stalks standing so that the remaining bolls which may contain pink bollworm larvae will get several freezes.

Poor timing of crop inspections and application of controls wastes materials, time and money. We check and recheck cotton leaves, terminals and the inside of bracts for insects. When the count or damage reaches a certain point, or is marginal, we always apply insecticides immediately, weather permitting. Each hour of delay costs us in production and material applied.

With cotton, we use two or three applications of insecticides, by tractor spray equipment, during the three-week pre-fruiting period beginning before squares form and during early formation. When early controls are effective, the plants usually make good growth before it becomes necessary to apply additional control material, and the season has progressed such that subsequent applications warrant the use of plane equipment for spraying or dusting. At this stage we prefer the dust since it tends to boil about the stalks, terminals, bracts and under leaves. Effectiveness of control procedures depends on four factors: the selection of proper control media, proper strength, sufficient quantity and good application practices. We have found that the failure of an insecticide to control insects usually indicates an insufficient quantity of material. This is poor economy, especially in late season controls when plants are maturing. Repetition and timing of dustings is determined by checkings, as eggs mature, the insect count and damage. Good control of late infestations of cotton aphids is highly desirable to prevent the deposition of honeydew on seed cotton. A good application depends on time of day, air currents and moisture on plants.

There is a pre-emergence insecticide which carries systemic toxicity in the cotton plant for a period up to six weeks for protection against sucking insects. It definitely is a warm weather procedure. For the pre-fruiting period insect control we spray with malathion, parathion, dieldrin, and toxaphene with DDT or in combinations. On subsequent applications, we dust with BNC, parathion and DDT combinations in a sulphur vehicle for the control of bollworms, lygus, aphid and leafworms. For the control of bollworms we use 10 percent DDT in combinations and for leafworm, only, we use two percent parathion. For pink bollworms we use DDT regularly every seven days. All late applications are done by plane.

Good crop production is directly dependent upon harmful insect control. Therefore, we practice early, intermediate and late applications of insecticides as may be indicated by presence of harmful insects. Good timing and sufficient quantity of media is essential to good controls and a good set of fruit.

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Late Information On Low-Cost Weed Control

JOHN H. MILLER, Agronomist, U.S. Cotton Field Station, Shafter

The job of weed control begins early, long before the crop is planted. The elimination of old plant residues is particularly important to early cultivation. Stalk cutting, along with deep plowing, will cover the residues and provide for more efficient early cultivation.

Proper leveling and grading of the land prior to seedbed preparation will do much to avert weed problems later in the season. Water trapped in low spots or at the ends of "irrigation runs" creates an ideal situation for grassy weeds. Uniform land provides for uniform watering. This, in turn, provides for uniform emergence of the cotton crop. This is very essential to effective early cultivation for weed control. Efficient cultivation, or herbicide application, is dependent upon uniformly spaced beds. All bedding, plants and cultivating equipment should be adjusted by use of the line diagram.

A three-year study was conducted to determine the effect of different seed

placements on cotton yield and picking efficiency. Planting high in the beds was compared to planting deep in the beds. While seed placement had little effect upon yield or picking efficiency, early weed control by cultivation was more effective when low-bed planting was used. A study of various cultural methods for the control of nutgrass in cotton showed that deep planting provided for more effective early nutgrass control by cultivation than was possible with high bed planting.

• **Cultural Methods** — Cultivation is still the principal means of weed control in Western cotton producing areas. Research has shown that bed knives, rotary hoes, reversed disc hillers and directed oil sprays, properly utilized individually or in combination, are effective supplements to normal sweep cultivation for early weed control.

Small annual weeds may easily be killed: therefore, timing is essential for effective weed control. This is particularly true when very little soil can be moved because of small cotton. These operations, other than directed oiling, may be utilized as soon as sufficient cotton has emerged to enable the operator to follow the row.

Directed oiling requires a relatively smooth bed and must be delayed until the cotton reaches a height of two inches in order to avoid damaging the cotton plants. Oiling, likewise, must be discontinued as soon as the cotton stems crack.

Flame cultivation has been recommended for several years in California. In recent years, improved heat exchangers and improved types of burners have materially improved the performance of flame cultivation. Studies indicate that still more improvements in burner adjustment can be made. The yield of cotton has not been reduced by flame cultivation when properly used.

Under conditions of heavy watergrass infestation, flame cultivation resulted in an increased net return of slightly more than two cents per pound of lint cotton, despite no increase in yield. This increase was the result of improved quality. Flame cultivation must be delayed until the stems of the cotton plants are approximately three-sixteenths-inch in diameter, or when the plants are about eight inches tall. With properly shielded equipment the practice can be utilized until cotton bolls begin to open. Flame cultivation, during the period it can be used, provides the most economical and satisfactory control method available at the present time for control of annual grasses in California cotton.

• **Chemical Methods** — Pre-emergence applications of herbicides have not proven a reliable method of weed control in California. Data at Shafter have shown results to be directly correlated with rainfall. In 1954 when 0.38 inch of rain fell shortly after herbicide application, weed control was erratic and generally unsatisfactory. Of the herbicides used, NPA at four and eight pounds per acre and CIPC at six and 12 pounds per acre gave the most satisfactory control. In 1955 showers totalling one and one-half inches fell within one week after herbicide application. Under these conditions, NPA, CIPC, monuron and diuron, at three different rates each, provided highly satisfactory weed control for 12 weeks. NPA provided the most complete weed control, but seriously reduced the stand of cotton. Weed control with other herbicides was generally unsatisfactory. The fact that rainfall of any consequence is neither normally expected nor desired (because of soil crusting problems in many areas) places definite limitations upon pre-emergence use of herbicides in Western cotton.

Directed sprays of monuron at rates of three-fourths to one and one-fourth pounds per acre applied at lay-by are recommended in Arizona for the control of annual morning glory and late germinating annual grasses. In California, summer rains very seldom occur. Under these conditions directed sprays of monuron or diuron at rates of one to one and five-tenths pounds per acre, NPA at six to nine pounds per acre, or CIPC at six to nine pounds per acre, applied pre-emergence to the weeds at mid-season or lay-by, resulted in satisfactory annual weed control when special attention was given to irrigation following the application. These treatments have been satisfactory only when the beds of the cotton rows have been throughly wetted following the herbicide application.

When the surface of the soil remained dry over the tops of the beds all herbicides failed to control weeds. This means that special care in land leveling and bed formation is necessary to provide for uniform control of water. It also means that, with the irrigation immediately following herbicide application, somewhat more water than is necessary for the cotton crop is required in order to thoroughly wet the entire surface of the bed. Unless the grower can meet these requirements, the use of residual herbicide sprays in California will result in wasting time and money.

The substituted urea herbicides (monuron and diuron) are less soluble than NPA or CIPC and therefore normally will provide weed control for a longer period of time. By the same token, however, residues toxic to succeeding crops are more likely to persist.

Perennial weeds present an entirely different problem. At the present time, Johnsongrass is the most widespread perennial weed in California cotton. Neither cultivation alone, nor cultivation supplemented by flame, is sufficient to adequately control this weed.

For spot infestations of broadleaved perennial weeds in cotton (field bindweed, Russian knapweed and whitenettle) the use of soil sterilants and soil fumigants offers the best control method now available. Research has shown that several soil sterilants used at rates suggested by the manufacturers for the elimination of these weeds may, for the most part, be inactivated in the soil by the end of one season. During the summer of 1956, 50 inches of water in increments of approximately five inches each were applied as flood irrigation to Hesperia fine sandy loam soil treated with six different soil sterilants. Counts of dead and live barley plants 60 days after an October seeding showed 90 percent or more survival for all treatments.

Regardless of the weed control measure being practiced, one cannot overemphasize the importance of timeliness of operation for effective weed control.

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Spot Treatment of Johnsongrass Made Easier and More Effective

FRED C. ELLIOTT, Cotton Work Specialist, Texas Extension Service.

Spot-treatment of Johnsongrass is faster, easier, cheaper and superior to hand hoeing. In addition, established Johnsongrass can be eradicated in one season. Hand hoeing results in the loss of yield due to serious injury to stands of cotton in heavy infestations.

Heavy infestations of Johnsongrass can best be controlled by tillage methods; however, 50 percent infestations were successfully eradicated in 1957 with spot-treatment. Infestations of five to 15 percent are easily handled with spot-treatment.

The time to start spot-treating Johnsongrass is when the grass is no more than six to eight inches in height. The spot-oiling treatment consists of applying a small amount of naphtha during cool weather, or a 50-50 mixture of naptha and diesel in warm weather, to the stem of the grass at the ground line. When oils are used the foliage is not sprayed. The grass will turn brown and begin to die within three or four hours. Application equipment has been perfected so that the stand of cotton will not be injured.

• **New Equipment**—Spot-spraying methods developed during the past seven years are used to supplement cultural practices and are suitable for controlling established Johnsongrass infestations up to 50 percent in cotton, 25 percent in corn and 40 percent in sorghum. The Texas jetgun was highly effective for selective application of a variety of oil and water sprays at College Station in 1957. Six spot applications of a mixture of one-half naptha and one-half kerosene at about 10 day intervals with this sprayer eradicated a 50 percent infestation of Johnsongrass sprouts in irrigated cotton for $17.75 per acre for both labor and materials. Similar use of Dalapon and water was safe and effective but slightly more expensive.

The Texas gravity-flow sprayer can be built by any local sheet metal shop. It consists of a three gallon back-pack spray can, a connecting hose, a spring tension hand valve and 30 x ⅛ inch galvanized spray pipe equipped with a spraying systems ⅛ KGF flooding nozzle. This nozzle was designed especially for this sprayer. The flow of oil spray is by gravity and it is responsive to the action of the hand valve.

The Texas jetgun permits efficient, economical and selective treatment of Johnsongrass in row crops with either oil or water sprays. It is a squirt gun and works like a water pistol. It can be used to hit a target varying in size from a dime to a dinner plate. Johnsongrass sprouts are never too close to cotton plants to prevent them from being treated safely if the Texas blade is used with a jetgun. About 1,8000 Johnsongrass sprouts can be treated with a gallon of spray if a jetgun is used, and they can be treated faster than with any other hand sprayer available.

This sprayer consists of a three-gallon back-pack spray can, a connecting hose, a squeeze type diaphragm pump and a spray wand. The spray can is identical

with the one used for the gravity sprayer. It is small and is held conveniently. It is operated by the same hand that aims the spray at the target. The spray wand is a lightweight, rigid 24-inch steel tube equipped with a spraying systems one-eighth TG2 full cone nozzle, a 50-mesh screen and a check valve. After it is primed, the pump controls the flow of the spray. A check valve in the pump prevents back flow in the check valve and the nozzle prevents leaking or discharge of spray at pressure under five pounds per square inch.

The slide-gun is for coarse work, such as the nonselective spraying of thick stands of Johnsongrass in spots where the crop is sparse enough to be sacrificed. The Texas slide-gun handles either oil or water, but is used mostly for water sprays. A clump of Johnsongrass as big as a wash tub can be sprayed with a single shot from a slide-gun. About 100 such shots can be made with a gallon of spray. The spray line, valves and nozzles can be adapted for tractor use in thin infestations. This is preferred by some growers to the knapsack type sprayer.

Spot-treatment refers to the use of oils and to the use of water carried materials, such as Dalapon. The spot for applying oils is on the stem at the ground line. The spot for applying Dalapon in water is in the terminal swirl of small grass. Dalapon in water is also used as a foliage spray in which case the entire foliage of the Johnsongrass is wet with the spray.

The use of Dalapon in water is safe and effective but slightly more expensive. However, care must be exercised in the use of water spray materials to avoid damage to the cotton crop. The contact sprays and the systemic and residual sprays used for spot-treating established Johnsongrass in crops cost from 13 cents per gallon to 44 cents per gallon.

• **Other Uses** — These materials have several possibilities other than for the control of grass in row crops. Fence rows and irrigation ditches have proved a source of reinfestation and Johnsongrass in these locations can be successfully controlled with these materials.

Also, other broadleaf weeds as well as grasses have been controlled by using the same sprayers and materials. Thus, these materials and sprayers can be used to eliminate hand hoeing, making the job faster, easier and less expensive. Therefore, it is possible to control all types of grasses and broadleaf weeds in cotton and other row crops.

Seedling Johnsongrass can be controlled in young cotton by use of naphtha applied as a post-emergence practice.

• **Recommendations** — (1) Use a Texas gravity sprayer for crown-oiling thin stands of Johnsongrass sprouts interspread in cotton and other row crops, (2) Use a Texas jetgun for spraying either thick or thin stands of recently emerged Johnsongrass sprouts in row crops with any suitable oil or water spray, (3) Use a Texas blade with a jetgun to help keep the spray off crop plants when making close shots and to cut stray weeds that are not sprayed, (4) Use a Texas slide-gun for spraying sparse spots of Johnsongrass before planting and in the crop when the stand in the treated spots can be sacrificed economically. Also use a slide-gun for spraying non-crop sites where a power sprayer is not available.

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My Experiences With Today's Weed Control

L. E. ARCHER, Farmer, La Mesa, N.M.

Effective control of summer annual weeds in growing cotton in the Mesilla Valley of New Mexico has long been a major expense item, especially during seasons with frequent rain showers. Some farmers have spent as high as $20 per acre or more, after lay-by, to control weeds by hand hoeing.

While weed control by flaming or spring-weeders attached to cultivators has been used in the past, these methods have not proven completely satisfactory on our farm, and we have relied primarily on hand hoeing to control late season weeds. Water grass, annual morning glory and pig-weed, in particular, have been expensive to control, and often impossible, especially during heavy rainy seasons.

Experimental results with chemical weed control have attracted considerable attention. This past season, several farmers used Karmex in field trials. This report deals exclusively with this method.

As our experience with Karmex has been limited to just one year, and one soil type obviously any conclusions may be premature.

Karmex was applied on or about June 25, under the supervision of a company representative, at the rate of one and one-fourth pounds per acre on a silty loam soil, fairly free of clods. The cotton at that time was about 12 inches tall. The cost at that time was $8.03 per acre.

Previous crops grown were: alfalfa irrigated pasture, corn, and lettuce. We believe both fields were normally infested with water grass, morning glory, pigweed, with some nutgrass, Johnsongrass, and bindweed.

A water solution of Karmex was sprayed on so as to completely cover the entire surface of the row and water furrow. The cotton was irrigated within three days after application, and subsequently no cultivation of any sort was used.

The results were most satisfactory. We obtained almost complete control of water grass and had comparatively very little morning-glory and pigweed. We found no effect on established Johnsongrass or bindweed. The growth of the nutgrass seemed to be somewhat retarded. We did hand hoe the 70 acres twice, but would probably have been no worse off, if we had not done so.

On the basis of this one year's experience, the use of Karmex, as applied, looks very promising as a summer weed control; and, a possible solution to a major problem in a more complete mechanization of growing cotton in our locality.

Careless application will greatly reduce the effectiveness of the chemical and could adversely effect the growth of the plant.

We believe the proper time to apply the control, in our district, is immediately before the first summer irrigation in late June or early July.

One 40-acre block, when compared to another plot of approximate equal fertility and wilt, showed an increase of about one-half bale in yield. Possibly not cultivating during the fruiting period had some effect in the increased yield.

The apparent saving on cultivation and hand hoeing was about $10 to $15 per acre, exclusive of any increase in yield which might have resulted from the absence of root paring by cultivation.

Based on our limited experience, we would make the following recommendation to those who wish to try chemical control: 1. Close supervision of the application by the farmer, or a reliable person, is of primary importance.

2. The chemical should be applied, in our valley at least, when the cotton is 12 to 15 inches tall, the crop is at the cleanest stage, and immediately prior to the first summer irrigation.

3. Every effort to eliminate cloddiness should be made.

4. Use the best equipment the farmer can get, or hire a reliable custom applicator. Proper agitation, nozzle pressure, etc. have a direct effect on the success or failure of the application. Tanks used, must be clean and free from any sediment. We intend to use a front mount sprayer, so the operator will be better able to watch the spray pattern for proper coverage and to detect any failure quickly. We have thought of using some sort of dye in the solution to make the spray pattern more easily seen.

5. Rates recommended by the manufacturer should be followed. We believe a rate of one to one and one-fourth pound in the row, and from one and one-half to one and three-fourths pounds in the water furrow will give better results, as the hot sunshine during July is the biggest enemy of the lasting effect of the chemical. Practically all regrowth was found about four to six inches from the row itself and in the water furrow.

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Better Techniques In Defoliation

LAMAR C. BROWN, Physiologist, USDA, Agronomy Dept., University of Arizona, Tucson.

One of the latest techniques used to improve defoliation is the use of wetting agents with chemical defoliants. In recent years, the use of wetting agents with spray-type chemical cotton defoliants has become a commercial practice in many areas of the Cotton Belt. When mixed with any of several defoliant chemicals, wetting agents often improve the efficiency of cotton defoliation. That is, leaf fall is hastened and the amount of defoliation increased. There are many instances, however, in which the use of wetting agents with chemical defoliants failed to increase defoliation efficiency. Excellent defoliation is often obtained with chemical defoliants alone.

Results from commercial applications of defoliant-wetting agent mixtures are often conflicting, and there is disagreement as to the value of using wetting agents in combination with chemical defoliants. Some of the disagreement is to be expected. The performance of chemical defoliants varies over the Cotton Belt and variations in the performance of defoliant-wetting agent mixtures would be expected. Also, wetting-agents are seldom used in areas where dust-type defoliants predominate, and recommendations would be lacking. In fact, most publications which offer de-

foliation recommendations do not define the use of wetting agents.

• **Definition of Terms** — It might be advantageous at this point to define the use of the term wetting agent. A wide variety of terms are used in the literature to designate surface-active agents. For example—activator, additive, adjuvant, deposit builder, detergent, dispersing agent, emulsifier, spray modifier, spreader, surfactant, wetting agent. Although definitions will vary, such terms often are used synonymously to designate a particular surface-active agent. For example, surface-active agent "X" may be referred to as an additive, detergent, or wetting agent, depending upon the reference. Such "confusion" with respect to terminology may result in a grower using a common washday detergent as a wetting agent with such results as clogged nozzles or excessive foam in spray tanks. It is no wonder that there is disagreement as to the value of using wetting agents in combination with chemical defoliants.

Most wetting agents commonly used in combination with chemical defoliants are organic chemicals which, in part, serve to reduce interfacial tension. Evidence to date indicates that wetting agents aid the penetration of other substances into plant cells, increase the spreading of droplets over the leaf surface, create a more uniform droplet size, and tend to "stick" the defoliant material to the leaf.

This discussion is based on data obtained from field and greenhouse experiments in which the effect of chemical defoliants and defoliant-wetting agent mixtures could be correlated with variations in nitrogen fertilization, leaf conditions, plant maturity, and temperature. Defoliant and defoliant-wetting agent mixtures also were applied to second growth.

• **Results** — Under conditions unfavorable for defoliation, the use of a defoliant-wetting agent mixture, as compared to a defoliant alone, resulted in a significant increase in defoliation in each experiment which involved nitrogen, leaf condition, maturity, and low temperatures. The increase in the amount of leaf fall ranged from five to 30 percent.

Under favorable conditions for defoliation (such as low nitrogen, no moisture stress, mature leaves and bolls, and high temperatures) the gain in leaves defoliated was not significant; usually it was about five percent.

Although the amount of second growth defoliated was increased with the use of defoliant-wetting agent mixtures, the net gain in defoliation of second growth was of no great commercial significance. Maximum amount of second growth defoliated in any experiment was 15 percent.

Leaf counts were made prior to and following chemical application to determine the amount and rapidity of leaf fall. Under unfavorable conditions, maximum defoliation was obtained on an average of four days earlier in the plots treated with a defoliant-wetting agent mixture than in plots treated solely with defoliants. Under favorable conditions maximum defoliation occurred three days earlier in the defoliant-wetting agent treated plots than in plots treated with defoliants alone.

• **Conclusions** — 1. The use of wetting agents with chemical defoliants appears advisable if the grower finds it necessary to apply defoliants to cotton when conditions are unfavorable. The use of wetting agents with chemical defoliants increased both the amount and rapidity of defoliation when chemicals were applied to cotton under unfavorable or limiting conditions such as wilted, toughened, and inactive leaves; immature bolls and leaves; low temperatures; or conditions due to excessive applications of nitrogen.

2. Under conditions favorable for defoliation the use of wetting agents hastened leaf fall but no significant gain in total leaf fall was evident. However, rapidity of leaf fall can be an important factor since harvesting is often scheduled to begin as soon as possible after maximum defoliation is obtained.

3. Defoliant-wetting agent mixtures increased the amount of second growth defoliation, but such increases were not commercially important.

4. The use of wetting agents with chemical defoliants did not retard defoliation in any of the experiments.

• **Additional Considerations** — Recommended rates usually range from one to two quarts of wetting agent per 100 gallons of solution. However, rates may vary slightly, depending upon the wetting agent used, location, and other factors. In general, use the wetting agent recommended by the manufacturer or distributor. Soap chips or washday detergents are not desirable. Such materials have not proved practical substitutes for effective wetting agent materials.

Use care is choosing a suitable wetting agent, since some materials may clog the nozzles of sprayers or cause excessive foam in spray tanks. In fact, some of the disagreement regarding the effectiveness of wetting agents may be due in part to an unwise choice of wetting agent.

Some defoliant materials may contain a wetting agent (pre-mix by the manufacturer or distributor). Although the most common practice is to mix the wetting agent with the defoliant solution just prior to application, check to learn if the defoliant already contains a wetting agent.

Beneficial results obtained from the use of wetting agents, such as an increase in the amount and rapidity of leaf fall, should not encourage growers to neglect proper precautions with respect to defoliant applications. For example, premature applications of defoliant materials can result in a lowering of grade and yield. Also, the amount of defoliation obtained under unfavorable conditions, even if a wetting agent is used, will not be equal to that obtained when defoliants are applied under conditions favorable for defoliation.

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My Experience With Ground Equipment For Defoliation

FREDERICK G. CORBUS,
Producer, Scottsdale, Ariz.

We have found that a properly shielded, sufficiently powered four-row rig can get through cotton with no significant damage. Timing is important in that a great deal of our cotton can get too big and too tangled if bottom defoliation is not done early in the season. Also, the benefits of bottom defoliation are lost if it is not done early. The rigs that we have used, and are using, have all been powered with industrial engines and individual rigs have been equipped with 260 to 300 gallon tanks; 8,003 nozzles with two nozzles per row and 40 to 60 pounds pressure have been used. With this equipment we have gone as high as 40 acres a day in solid or skip row cotton we use 12 gallons of water per acre.

An example of loss through tearing mature bolls from the plant was forcibly impressed upon me when one of our customers was debating the problem and requested that I crawl through a one-quarter mile row of six foot cotton and count the bolls which had been droped on the ground. I did so, and then three or four of us estimated the total number of bolls on the plants and arrived at a figure of two percent as being the number of bolls which were found on the ground. My figures were checked by having one of the hands go through another row with a gunny sack and dumping the sack at the end of the row. The counts were nearly identical.

I have made an effort to estimate the cost to a grower or a group of growers if they owned equipment of the nature we are using. Assuming that the total acreage involved was 400 to 600 and that the rig was used for bottom and total defoliation and for its reasonable share of insecticide work, the cost would come close to $2.00 per acre for the operation of the bottom defoliation, plus the cost of material which at this time is averaging about $1.10. We feel the gain has been in the quality cotton which is possible to pick by hand. We feel there is definitely an early opening, a reduction of boll rot and an overall larger cotton yield.

• **Proper Planning** — With the best of planning, you still will be faced with wet fields, which even the high-powered rigs will be unable to get through. Further problems are the matter of clean water and clean tanks. We are not satisfied to attempt defoliation unless we are geting water from a well site or from a domestic water supply. One more problem is in irrigation after the bottom defoliation has been completed in that the amount of leaf drop in the row will interfere. In our experience, the leaf drop is more certain and predictable than with total defoliation.

• **Total Defoliation** — Using the same equipment as described for bottom defoliation, we started three years ago with five nozzles per row—two on each side on drops and one over the center. We did four rows per trip using T-4 or D-2 nozzles and applying 40 to 50 gallons of water per acre. We attempted smaller gallonages and smaller nozzles but too frequently plugging resulted. The larger gallonage and more frequent fills were more than compensated for by the fewer nozzle plug-ups. Two years ago we developed an air boom, which enabled us to reduce our nozzles per row to two. We use a hollow boom, slightly tapered, above the plumbing work. Air, developed by a squirrel-cage blower, is introduced into the boom. The plumbing, mounted directly under the boom, has the nozzles placed directly below and

(Continued on Page 50)

Classified Advertising

RATES AND CLOSING DATES: Ten cents per word per insertion. Include your firm name and address in making word count. Minimum charge $2.00. Copy must be in our hands by Thursday morning of week of issue. Please write plainly.

Oil Mill Equipment for Sale

FOR SALE—New V. D. Anderson Expeller parts. New Fairbanks Morse 16' x 12' 80,000 lbs. suspension bearing pipe lever hopper scale. Oil refining equipment, oil screening tank, Vogt oil chiller, 42", 36", and 30" filter presses, California heavy duty pellet mills complete with pellet coolers, shakers, and 50 h.p. T.E.F.C. motors, Carter gyrator screen, five-high cracking rolls, scale tanks, complete with Toledo scales, Richardson scales, meal coolers, pumps, and motors. Contact Lee Atherton of Archer-Daniels-Midland Co., Minneapolis, Minnesota.

FOR SALE—Filter presses, screening tanks, single and twin motor Anderson Super Duo expellers, 141-saw linters, baling presses, car unloader, Bauer #190 seed cleaners, Bauer #153 and 402 separating units, bar and disc hullers, 72" and 85" stack cookers, 72" 4-hi stack cookers for French expellers with enclosed drive, 42" and 60" rolls, boilers, hydraulic press room equipment.—V. A. Lesoor & Co., P. O. Box 108, Fort Worth, Texas.

FOR SALE—141 saw Carver wood front eccentric adjustment ball bearing linters, Fort Worth brushless units, permanent magnets, Continental feeders, GIVEAWAY PRICE. Worth having just for parts. Also 3 saw carts, Butters milling machine, Continental single box press and pump, 5-high 48" Smith & Vaile rolls.—Central Oil & Milling Company, Clayton, N.C.

FOR SALE—All-steel vertical oil storage tanks. 16-11'0" O.D. x 21' 0" high. 8-20'0" O.D. x 20'0" high. 5-35'0" O.D. x 47'8" high. Including manholes, ladders and walkway. All welded. Also 1-100 h.p. and 1-80 h.p. Erie City boilers, 150 lbs. pressure, complete with natural gas burners and auxiliary equipment. All above purchased new in 1949. Used only short time. Contact Lee Atherton, Archer-Daniels-Midland Co., Minneapolis, Minnesota.

FOR SALE—Anderson Super Duo expellers. Filter presses. D-K 90" 5-high all-steel cooker; 2 French 5-high 72" expeller cookers. Bauer 190—60" seed cleaner. Bauer 153 separating unit. Butters milling machine. Carver 176-saw Tru-line gummer. Carver double-drum hull beater. 141-saw Carver linters. Double-box linter press. Bar hullers. Attrition mills. 20" to 80" fans. Motors: 75 h.p. and under. Starting boxes and switches.—Sproles & Cook Machinery Co., 159 Howell St., Dallas, Texas. Telephone RI-7-5958.

INSPECTIONS and appraisal. Dismantle and installation.—Oscar V. Shults, Industrial Engineering, Phone BUtler 9-2172, P. O. Box 357, Grapevine, Texas.

OIL MILL EQUIPMENT FOR SALE — Rebuilt twin motor Anderson high speed expellers, French screw presses, stack cookers, meal coolers, fourteen inch conditioners, filter presses, oil screening tanks, complete modern prepressing or single press expeller mills.—Pittock & Associates, Glen Riddle, Pennsylvania.

Gin Equipment for Sale

FOR SALE—4-90 saw, less one, Gullett outfit with Mitchell Super Chief, tower drier, inclined cleaner, long box down-packing press, with steel building. All built new in 1954. You can steal this bargain. —Sam Clements, West Memphis, Ark.

FOR SALE—Two complete, all-steel, all-electric late model Murray gins. One 5-80 and one 4-90, both with all grid bar cleaners, 4-cylinder airlines, 2-72" 7-cylinder incline cleaners, 14' bur machines, Super Mitchells, Moss lint cleaners, new Murray Big Reel driers with 3 million BTU heaters, all-steel Murray presses. Each gin has extra large Murray sectional building with two extra large steel warehouses. Five room modern office with 50' truck scales, and several acres of land. Gins are in good condition, located in good water, all-irrigated belt and doing good business. Phone SWift 9-4940, Lubbock, Texas.

FOR SALE—Complete Continental gin plant, corn sheller and all equipment. All in operation last year. Priced to sell.—Eugene Sulak, Route 1, West, Texas.

SPECIAL BARGAINS—One 14' late model all-steel Continental bur machine with factory steel supports, platform, ladder and return conveyor and trough, like new. 10' and 14' Lummus steel bur machines. Steel cleaners: 50" Continental Impact, 6-cylinder 50" and 4-cylinder 50" Continental, 6-cylinder Stacy, 7-cylinder 50" Hardwicke-Etter, 8' 4-cylinder Lummus, 5-cylinder 50" blow in Gullett. Five Murray saw type and four 1949 model Continental lint cleaner. Continental machines brought up to date. 5-80 saw late model Murray glass front gin stands. Mitchell convertible and super units in 60" and 66" lengths. Two trough Continental and two Murray Big Reel driers. New tower driers in any size. Lummus and Gullett seed scales. 42" type M and cleaner type Lummus, 50" Gullett and 52" Murray VS steel separators. Lummus horizontal triplex with 15 h.p. electric motor and Continental fully enclosed automatic lubrication, back gear driven, vertical triplex press pumps. New and used fans, belting, conveyor trough and a general line of transmission equipment. For your largest, oldest and most reliable source of used and reconditioned gin machinery, contact us. Call us regarding any machinery or complete gin plants which you have for sale or trade.—R. B. Strickland & Co., 12-A Hackberry St., Phones: Day PL-2-8141, Night PL-3-7929, Waco, Texas.

FOR SALE—One swinging door double press, steel bound. 100 h.p. motor, 5-80 12" gin stands, 5-cylinder air draft cleaner, 35" superblast suction fan, Howe scales—weighing capacity, 10 tons, steel noiseless Cameron automatic cotton packer, shafting in various sizes and bearings, pulleys, belting, etc. In very good condition. For further details write Kollaja Gin Company, P. O. Box 273, Ganado, Texas.

FOR SALE—4 Murray stands—80 glass front, roll dump, Howell mote, 4 Super Mitchell feeders and Mitchell conveyor distributor, Lummus down-packing press, tramper and press pump, 8 drums —Stacy cleaner with hot air manifold and Stacy dropper, 3 Phillips fans—23", 40", and 48", 1½-million B.T.U. Murray burner and ¾-million B.T.U. Mitchell, 2 seed scales, 14' Wichita bur machine. Will sell or will furnish any part of equipment to form partnership in new location.—V. H. Knauth, Weir, Texas. Phone 3097, Georgetown, Texas.

FOR SALE—Three 2-trough driers, 5-66" Super Units, 5-60" Super Units, 4-cylinder Mitchell precleaners, Continental all-steel up-packing press with EJ tramper, Lummus steel bound down-packing press with automatic tramper. All kinds separators and most any item you need.—Sam Clements, West Memphis, Ark.

EXCELLENT BARGAIN — Very reasonable — 1-1958 Model Lummus lint cleaning comber complete. 4-80 saw glass front Lummus airblast huller automatic gin stands with seed conveyor and connections and including saw shaft couplings.—Cedar Bluff Gin Company (Pearson Brothers), Cedar Bluff, Alabama.

FOR SALE—Complete 4-80 saw air blast Model C gins, all-steel up-packing paragon press, E.J. tramper, triplex pump base tank and cover, all Continental. Press alone worth the price of the outfit—$7,500.—James C. Mann, phone 2267, Covington, Ga.

FOR SALE—One complete Murray gin with 24-shelf tower drier and 220 h.p. MM gas engine. Perfect condition. Will sell to be moved or to be run. This gin closed this December, 1957, due to manager's retirement. Write or call Vernon Schrade, CHurchill 5-3304 or CHurchill 5-3347, Rowlett, Texas.

FOR SALE—Complete gin plants. Second hand and reconditioned gin machinery.—Sam Clements, Phone REgent 5-3764, West Memphis, Arkansas.

FOR SALE — Hinckley all-steel, 4-drum drier cleaner, 3 years old.—Manofsky Gin Company, Phone CS-3698, Night CS-2422, Bay City, Texas.

FOR SALE—2-72" Continental square condensers with bottom discharge lint slides and duct. In good condition.—Acuff Co-op Gins, Route 1, Lubbock, Texas. Phone TH 2-2632.

FOR SALE—Cheap. To be moved. Located at Kingston, Oklahoma, one 6-cylinder Mitchell Jembo cleaner with extractor unit. Three-stand Mitchell conveyor distributor, three super Mitchell machines, three 1949 Model 80-saw, all-steel Centennial Commander gins with lint flue and connections. One 100 h.p. electric motor with starters, switches, conduit, cable and V-belt drive, one set of transmission, shafts, pulleys, belting, conveyor and telescoping, one 34' 40,000 capacity Webb truck scales. All the above priced at $4,000, or will sell separately. Contact Jim Hall, Phone Riverside 1-1393, P. O. Box 751, Dallas, Texas.

FOR SALE—Hinckley cleaner drier with grid bars.—W. L. Hillman, Phone 7-2981, Edna, Texas.

FOR SALE—Bargain. Located in Arkansas before removing. 1-10′ Continental bur machine with approximately 30′ overflow conveyor, steel platform and supports, 4-60″ Lummus conveyor distributor, 4-80 glass front Murray gins, one 14-shelf tower drier with burner.—Bill Smith, Box 694, Phones OR-4-9626 and OR-4-7847, Abilene, Texas.

LUMMUS COMBER — latest model for sale—Complete: cat-walks, supports, piping, etc. Like new. Make offer first letter.—C. D. Larmore, 836 North Central Avenue, Phoenix, Arizona.

FOR SALE—Hardwicke-Etter slightly used 5-drum inclined cleaner. Murray all-steel conveyor distributor. Murray 40″ airblast fan in perfect condition. Dodge and American steel split pulleys, size 8″ to 42″. Stub shafts, shafting, bearings, hangers and brackets.—Voltin Brothers, Burlington, Texas.

IMPORTANT NOTICE—All-steel outfits for sale: 5-80 Lummus, 4-80 Lummus DM, 3-80 Hardwicke-Etter and 3-80 Continental. 3-80 Murray with steel bound down-packing press. All priced to sell just over junk prices. Exporters please note. Call me quick.—Sam Clements, West Memphis, Ark.

FOR SALE—Lint cleaners: 4-90 1951 Murray saw type complete, 4-90 Lummus Jets complete with Hartzell fan and 30 h.p. motor, 5-90 1951 model Lummus Jets complete with lint flue, Hartzell fan and 40 h.p. motor. Gins: 4-90 Hardwicke-Etter, 4-80 Continental F3 brush, 5-80 Continental F3 AB, 5-90 Gullett, 4-80 Continental Model C brush with 30 fronts, 3-80 Model C brush, 17-80 glass front Murrays and lint flue for 4, 4-80 glass front Lummus and lint flue, 1-80 Continental Model E brush, 1-80 1949 Lummus. Huller cleaner feeders: 5-80 Hardwicke-Etter Green Leaf and Stick machine, 1-60″ Super Mitchell, 7-80 Continental Double X, 4-80 Lummus LEF's, 1-80 Lummus MEF. Cleaners: 1-52″ 8-cylinder V-drive Stacy, 1-72″ 6-cylinder Murray blow-in type, 1-8′ wide, 6-cylinder Lummus, 1-52″ Hardwicke-Etter, 1-52″ 4-cylinder Continental. Driers: One 14-shelf tower drier with burner, 2 Murray Big Reels, one 16-section Lummus Thermo-cleaner. Separators: 2-72″ Murrays, 1-52″ Murray, 1-52″ Continental, 1-52″ Gullett, 1-72″ Lummus. Bur machines: 2-10′ Wichitas with 3-cylinder aftercleaners, 1-10′ Continental with long overflow conveyor and steel platform, 1-14′ steel Hardwicke-Etter with steel platform. 1-14′ all-steel, V-drive Lummus, 1-10′ all-steel Lummus with 5-cylinder built-in after cleaner, 1-14′ Stacy. Conveyor distributors: One 5-80 Hardwicke-Etter, one 4-80 Lummus. Presses: One Continental steel bound up-packing, one Lummus steel bound down-packing. Seed scales: One set Hardwicke-Etter, one set Lummus. Engines: One V-8 Le Roi, one Twin Six MM, one 6-cylinder MM, one 6-cylinder Buda, one 6-cylinder Waukesha. Electric motors and fans in various sizes.—Bill Smith, Box 694, Phones OR-4-9626 and OR-4-7847, Abilene, Texas.

Equipment Wanted

WANTED—Complete gin plants and used gin machinery.—Sam Clements, West Memphis, Ark.

WANTED—2-10′ Lummus center feed bur machines with built-in 5-cylinder aftercleaners, all-steel. Advise price, year model, etc.—N. B. Embry Gin, Amherst, Texas.

Personnel Ads

WANTED—Ginner for June and July. 4-80 Munger brush system. Plant in excellent condition. State age, experience, and salary desired. Must be sober. Write Box VB, The Cotton Gin and Oil Mill Press, P. O. Box 7985, Dallas 26, Texas.

GIN OWNER—45 years old, over 30 years gin experience. Have closed own plant because of Soil Bank and acreage cut. Desire managership or will operate plant on commission, profit or other reasonable offer. Have rebuilt two plants last four years. Know long and short staple ginning. Recommendations furnished.—Box MA, The Cotton Gin and Oil Mill Press, P. O. Box 7985, Dallas 26, Texas.

EXPERIENCED erection engineer wants work in gin construction installing fill-in equipment, or dismantling and moving gin. Available any time from now until July 1, 1958. Will go anywhere in United States.—Box ZN, The Cotton Gin and Oil Mill Press, P. O. Box 7985, Dallas 26, Texas.

Power Units and Miscellaneous

FOR THE LARGEST STOCK of good, clean used gas or diesel engines in Texas, always see Stewart & Stevenson Services first. Contact your nearest branch.

FOR SALE—One 300 h.p., 700 RPM, 440 volt, 60 cycle, 3 phase, slipring Westinghouse electric motor.—R. W. Kimbell, Box 456, Earth, Texas.

SEE US for good used re-built engines, MM parts, belt lace, and Seal-Skin belt dressing.—Fort Worth Machinery Company, (Rear) 913 East Berry Street, Fort Worth, Texas.

FOR SALE—40 h.p. Moline and 40 h.p. Buda engines, rebuilt good as new, natural gas or butane. Climax R61, 150 h.p., good shape, with silent chain drive, $400 each.—Manofsky Gin Company, Phone C5-3698 or C5-2422, Bay City, Texas.

FOR SALE—1-125 h.p. G-A-W 12½ x 16 2-cylinder, 2-cycle, natural gas Cooper Bessemer engine. New heads and new governor. Air tanks and air jammer, all for $750, Madill, Oklahoma. Contact Jim Hall, phone RIverside 1-1393, Box 751, Dallas, Texas.

FOR SALE—One GM diesel engine, continuous 260 h.p. at 1600 RPM, Model 12104. One GM diesel engine, Model 671, 130 h.p. at 1600 RPM. These engines are now operating under U&O Breakdown Insurance Policy. Have been inspected in the past 60 days by Insurance Inspector and are in good condition.—Box QA, The Cotton Gin and Oil Mill Press, P. O. Box 7985, Dallas 26, Texas.

FOR SALE—One V-12-425 Climax engine, good condition with radiator and fan.—Box ET, The Cotton Gin and Oil Mill Press, P. O. Box 7985, Dallas 26, Texas.

FOR SALE—One L-3000 Le Roi 12-cylinder, 370 h.p. engine with drive complete.—Wells Farmers Co-op Gins, Rt. 3, O'Donnell, Texas. Jess O. Goode, manager.

FOR SALE—70-16½′ long 4″ boiler tubes.—Bill Smith, Box 694, Phones OR-4-9626 and OR-4-7847, Abilene, Texas.

Poole Will Be Speaker

Dr. R. F. Poole, president of Clemson College in South Carolina, will be principal speaker at the Atlantic Cotton Association meeting, April 11-12. The meeting will be in Palm Beach, Fla.

as viewed from The PRESS Box

• Cotton's Progress in the West

PRODUCTION PRACTICES in the Cotton West, the region which has made such great advances in recent years, are discussed in special material in this issue of The Cotton Gin and Oil Mill Press. This material will become the summary-proceedings of the 1958 Western Cotton Production Conference, held in El Paso. Conference sponsors are the Southwest Five-State Cotton Growers' Association and the National Cotton Council, in cooperation with many other groups. This will be reprinted and distributed by the sponsors.

• Know-How, Plus Do Something

SOYBEAN FACTS that will help farmers grow this oilseed crop are found in a special article in this issue. The article was written from authoritative information, and checked carefully by trained men who have studied soybeans in the South. It is practical information to help cotton oil mills increase their supply of soybeans for raw material to offset reduced cottonseed volume.

Industry leaders join The Press staff in urging oil mills in the Cotton Belt to consider carefully the value of making use of this information and of data in three articles which appeared in earlier issues. The entire purpose of this series is to assist cotton farmers and cotton oil mills—the extent of that assistance will depend very largely upon how much oil mills do with the information.

Oil mill leaders on the Pacific Coast are actively working to encourage oilseed production. For example, the West Coast Oilseeds Development Committee is distributing 4,000 copies of the article, "Soybeans in California," published March 8 in The Cotton Gin and Oil Mill Press.

• Imperial Cotton

IMPERIAL PERFORMANCE by cotton is featured in current advertising in Automotive News. Cotton's use in convertible tops, including the Chrysler Imperial, is stressed in the National Cotton Council advertisement which reaches new car dealers and auto manufacturers. A diagram shows where cotton's advantages keep automobiles "cooler, quiter, more comfortable."

• Kern County Leads

KERN COUNTY in California has ginned 447,648 bales of cotton this season (to March 3). Fresno ranked second with 387,850 bales and Tulare third in the state, with 265,126.

• Du Pont Spends More

PLANT EXPANSION costing $220 million and research costing $80 million last year are listed in the annual report of the Du Pont Co.

Du Pont is building more capacity to produce nylon, Orlon acrylic staple, Cellophane, Dacron textile fibers, polyethylene fabrics and other products. Six new plants will be built this year.

The $80 million spent in 1957 on research and development did not include laboratory construction or technical assistance to manufacturing and sales.

Research is being done by 2,200 scientists in 30 laboratories. Du Pont pointed out that $15 million was invested last year in basic research done by 400 persons.

Sales by Du Pont reached a new high of $1,965,000,000 in 1957, four percent above 1956.

• Two-Sided Sheets

DUAL-PURPOSE SHEETS were the newest thing at Britain's recent Cloth Fair. They are fleecy on one side and smooth on the other, for hot or cool weather.

The British say the "downward look" in clothing design is replacing the graph-paper effect.

• Never Understimate Bees

BEES are worth 15 times their actual value in their usefulness as pollination agents for crops, New Mexico beekeepers were told at their recent annual meeting. The importance of avoiding killing bees when insecticides are used by farmers was emphasized on the program.

• Choosing of Ginning Leaders Continues

MORE SELECTIONS of state Ginners of the Year are being announced as the time nears for the National Ginner of the Year award to be made in Dallas, on April 13 at the National Cotton Ginners' Association meeting.

States have announced in earlier editions of The Press the following selections:

Alabama-Florida — W. J. Chandler, Moundville, Ala.

Georgia — Edwin Shiver, Hahira.

North Carolina — W. G. Buie, III, Rockingham.

Oklahoma — Sam H. Lafaver, Watonga.

South Carolina — W. R. Britton, Sumter.

Texas — Jerome Jalufka, Robstown.

New Mexico Honors Craft

New Mexico has honored as its Ginner of the Year for 1957 Walter Craft. He first entered the ginning business in 1920 as an employee of the Otis Gin & Warehouse Co., Loving, N.M. He has been engaged in the business constantly since that time as manager of various gins and owner of his own plant at Malaga, N.M.

Craft was born in Lowell, Ind., Aug. 5, 1885, and moved to Chicago in 1904. He emigrated to Carlsbad, N.M., in June, 1908. He was married to the former Elsie Ferguson in Chicago in 1907. They are the parents of two children, James R. Craft and Ruth Caviness, and three grandchildren.

In addition to his ginning business, Walter has always participated fully in community affairs, having been a long-time member of the Eddy County and Carlsbad City School Boards. He has served each board as president and annually gives much support to other civic enterprises, such as 4-H and FFA clubs in their various activities.

Craft recently rebuilt his gin plant at Malaga, following a fire, and now has the most modern gin plant in the Carlsbad area. He constantly strives to maintain his machinery and services to stay abreast of the present-day demands on the ginning industry.

Craft also buys and sells cotton and distributes insecticides and fertilizers.

WALTER CRAFT

Craft has always been a strong supporter of ginning associations, being a long-time advisory director to the Texas Cotton Ginners' Association and having served two terms as a vice-president of Association and is now a director.

He was a strong influence in the formation of the New Mexico Cotton Ginners' the National Cotton Ginners'Association.

International Crushers List Entertainment

International Association of Seed Crushers will hold its Congress June 3-6 at the new Palais des Congres in Brussels, Belgium. Entertainment features include a luncheon, banquet and golf tournament.

Myers Wins Cotton Contest

S. P. Myers, Orangeburg County, produced 7,050 pounds of lint cotton on five acres to win the 1957 South Carolina Contest. His staple length was one and five-thirty-seconds inches.

Philippines Need Cotton

USDA says the Philippines should offer an expanding market for U.S. cotton, wheat and dry milk solids. Mill expansion will reduce imports of textiles.

Labor Meeting on March 31

Arkansas farmers will meet March 31 in Memphis to discuss the farm labor situation.

It's Usually Unusual, but

This Winter's One To Talk About

YOU'RE RIGHT, THIS TIME! Weather's usually unusual, in the opinion of ordinary folks, the weatherman always says. But, even Uncle Sam's trained observers admit that the winter of 1957-58 was something to tell your grandchildren about.

You don't even have to live at Paradise, Washington—where the snow was 169 inches deep on March 10—to talk about what a winter it's been. Florida residents, at the other extreme tip of the nation, caught it just about as rough as anyone.

Here's what the U.S. Weather Bureau thinks about it:

"Prolonged cold in the Southeast, paralyzing snowstorms in the Northeast, tornadoes in the Midwest and South, and persistent abnormally mild weather in the Far West were the main weather features of the unusual winter of 1957-58.

"Florida's coldest winter was outstanding as new records for sustained cold and frequency of freezes were set from almost one end of the state to the other. Several freezes occurred in north and central portions during the first week of December. Freezes occurred at frequent intervals in north and central portions during January and the first three weeks of February. This is the first time during the same winter that Florida has experienced such severe freezes in all three winter months. December was only slightly colder than normal, but January and February were the coldest or second coldest such months on record in most of the state.

"The cold wave which pushed the freeze-line into southern Florida on Feb. 17-18 affected virtually all areas east of the Rocky Mountains. The week ending Feb. 16 averaged more than 20° below normal in the middle and lower Mississippi Valley, the coldest week in some sections there in many years. The most notable temperature recorded during this cold period was -23° at Mt. Mitchell, N.C., the lowest temperature ever recorded in that state.

The frequency of heavy snowstorms in the Northeast was almost as remarkable as the unparalleled cold in the Southeast. Most of these storms affecting the Northeast came either from the mid-continent area or up the Atlantic coast.

"A major outbreak of tornadoes in the middle Mississippi Valley on Dec. 18 was unusually far northward for the time of year, when more than a score of tornadoes touched the ground in Illinois, alone that day."

So, if the superstition of old-timers is right, brace yourself for a real scorcher in August. "Cold winter, hot summer," they say.

Freeze Bill Passes But Veto Likely

The bill to freeze price supports and acreage allotments for another year passed the House of Representatives March 20 by 210 votes to 172. The close vote made it virtually certain that Congress will not override the expected veto by President Eisenhower, and is interpreted as a victory for the Secretary of Agriculture. (For more on the subject, see the report from our Washington Bureau in this issue.)

• Businessmen Invited To Special Program

THE IMPORTANCE of businesses serving agriculture—such as ginning, gin machinery manufacturing and oilseed processing, will be emphasized in a special program April 7 sponsored by Dallas Agricultural Club and Dallas Chamber of Commerce.

"Agribusiness—a New Dimension in Texas Economy" is the title of the presentation, to be made by the Texas A&M agricultural economics department, headed by Dr. Tyrus R. Timm.

Charles E. Ball, president, Dallas Agricultural Club; and Erik Jonsson, president, Dallas Chamber of Commerce, invite business and agricultural leaders to attend. Tickets for the dinner, 6 to 8 p.m. at the Adolphus Hotel, may be bought for $3.25 each from Ed Pewitt, secretary, Dallas Agricultural Club, Room 483, Dallas Court House, Dallas 2.

• Advisory Committee Recommends Work

RECOMMENDATIONS for cotton research were made by USDA's Cotton and Cottonseed Advisory Committee at its recent meeting.

Committee members also accepted an invitation from Plains Cotton Growers to meet in Lubbock next fall.

Research needs listed in recommendations included:

Production Research — Expand humid-area irrigation studies, using the scientific team approach to learn where, when, and how to irrigate cotton for most profitable production; strengthen investigations of both mechanical and chemical weed control; more study of the resistance of cotton insects to insecticides. (The committee pointed out that, with the exception of the bollworm and the pink bollworm, all major cotton insects have developed resistance to some of the insecticides currently being recommended).

Utilization Research — New studies aimed at developing winter-weight cotton fabrics, the market for these being the equivalent of 1,200,000 bales of cotton yearly; basic studies designed to incorporate aerodynamic principles in cotton cleaning and conveying machinery, so cotton may be processed with no damage to fibers; new research to develop a cotton fabric that will not transmit air from the inside of tubeless automobile tires; expanded fundamental studies on the chemistry of cottonseed oil; more study of the effects of heat and other conditions of processing on the amino-acid composition of cottonseed protein.

Home Economics Research — More research to learn the fundamental requirements of fabric serviceability, including the relationship of composition, construction, and finish, and of the the physical and chemical properties of fabrics; strengthen research on the launderability of cotton fabrics.

Marketing Research — New studies to develop equipment and techniques for detecting possible damage to cotton fiber, which might affect spinning efficiency; more investigations to develop instruments and techniques for determining fiber length, length uniformity, and length distribution; strengthen existing work relating to the automatic sampling of cotton bales.

Marketing Service and Educational Work — Begin a survey in foreign countries to learn the physical condition of American export cotton upon its arrival at ports and the methods of handling cotton from ports to mills.

Castorbeans, Safflower Best

Castorbeans and safflower appear to be more promising oilseed crops than soybeans, flax or sesame, according to Dr. David B. Rubis, University of Arizona. He recently told the West Coast Oilseeds Development Committee, meeting in Phoenix, that castorbeans have become well established.

While soybeans have made yields of 35 to 40 bushels in Pinal and Pima Counties, Dr. Rubis said these were not too encouraging in view of the high production costs. (For more on soybeans, see the article on Page 9 of this issue, and the item in the Press Box column, page 40—Editor).

Crosby County Observes First Cotton Week

Farmers and businessmen of Crosby County, Texas, observed the first annual Crosby County Cotton Week, starting March 10. Ralls was the center of activities, including a style show, barbecue given by gins and compresses, king and queen contest and parade.

Crosby County Farm Bureau, chambers of commerce at Ralls and Crosbyton, the Lorenzo Lions Club and others cooperated in the program.

Yugoslavia To Buy Oil

Yugoslavia has been authorized to buy $906,000 worth of refined soybean or cottonseed oil through Public Law 480.

Congress Plans To Be Made

Jeff Bell, manager, Harlingen Chamber of Commerce, will report on local arrangements for the American Cotton Congress at a committee meeting in Harlingen on March 31. The Congress will meet there June 4-5-6, when many entertainment features will supplement the business sessions. Burris C. Jackson, Hillsboro, Texas, heads the Statewide Cotton Committee of Texas which sponsors the Congress.

New Flax Variety

A new flax variety for North Central States, named Arny, has been released by USDA and the University of Minnesota. It is resistant to rust and wilt.

• Margarine Future Called Bright

MARGARINE is in a new expansion period which could be comparable to that which followed repeal of federal taxes eight years ago, the Margarine All-Industry Conference at Boca Raton, Fla., March 17-18, was told.

Siert Riepma, president, National Association of Margarine Manufacturers, said margarine established a new record in 1957 and it seems likely to outrank creamery butter steadily in the future.

"Margarine faces a golden future," Raymond Rodgers, New York University said, adding "the margarine industry is a dynamic one and the legislative trend and consumer trend is in your direction."

Kenneth M. Hart, board chairman of NAMM, said margarine quality always should be emphasized, with price a secondary factor.

Ralph Head, advertising agency executive, emphasized the importance of advertising and other marketing forces.

Dean W. Jones, also an advertising agency leader, predicted an excellent marketing climate for margarine, with emphasis on quality rather than price.

Operator of Gin Dies

Robert V. McCoy, Paragould, Ark., died March 13. He operated Leonard Gin Co. and had other business and farming interests. Survivors include his wife, two daughters, two brothers, a sister, a foster sister and three foster brothers.

To Preside in Dallas

JOE FLEMING, Huntsville, Ala., will preside at the annual meeting of National Cotton Ginners' Association, April 13 in Dallas. Fleming is president of the organization, which is meeting at the time of the Texas Cotton Ginners' Association convention. Other National Association officers include W. J. Estes, Haralson, Ga., first vice-president; Jerome Jalufka, Robstown, Texas, second vice-president; Carl Meriwether, Las Cruces, N.M., third vice-president; Tom Murray, Decatur, Ga., executive vice-president; and Carl Trice Williams, Jackson, Tenn., secretary-treasurer.

• Louisiana Mills Are Host to Leaders

SEVENTY-TWO out of 75 agricultural leaders invited were on hand at the Louisiana Cottonseed Crushers' Association dinner at Baton Rouge March 7. J. D. Fleming, NCPA executive vice-president, spoke; and Dalton E. Gandy, NCPA field representative, handled the arrangements, as he has done since this annual good-will meeting began. Many Louisiana crushers attended and acted as hosts.

Dr. George Robertson, LSU animal husbandry department head, spoke, and paid tribute to the industry's public relations. As an example, he cited his personal experience as a student, when the Educational Service of NCPA made it possible for him to go to Chicago to present a cottonseed meal research paper. "You will never know how much that meant to me," he commented.

Plainview Compress Will Be Carnival Center

Hi Plains Cotton Carnival will be held May 7-9 at Plainview, Texas. Plainview Co-op Compress will be headquarters for activities, which attracted more than 3,500 persons last year. A queen contest, talent show, style show and display booths are planned.

Joe Don Scott is chairman of the arrangements committee, which includes Glen Hunt, John Will Speck, Aubrey Ellison, John Peed, Bill Waddell and Bundy Bratcher. Dick Dye is general chairman.

A. T. Ferrell and Co. Has Round Table Conference

A. T. Ferrell and Co. recently held its 1958 Round Table Conference at the Saginaw, Mich., factory. In addition to the firm's regular sales and service personnel, representatives from the company's manufacturer's agents throughout the U.S. and Canada attended.

Purpose of the Ferrell meeting is to bring about closer liason between the end user and factory. This "shirt-sleeve" type of meeting, the firm feels, offers opportunity for free interchange of ideas, and benefits customers, salesmen and the manufacturer.

A dinner for the entire sales force and plant supervision staff ended the meeting.

New Book by Cardozier

Dr. V. Ray Cardozier, University of Tennessee and former member of the National Cotton Council staff, is the author of a new book. "Public Relations for Vocational Agriculture" is the title.

The book tells how standard methods of communication can be adapted to help the vocational agriculture teacher inform his community about his work. It points up the need for explaining the teacher's evening class program for adult farmers and other off campus work which make vocational agriculture different from traditional accademic subjects.

New General Sales Manager

FRANK E. PRINGLE has been named general sales manager of the Howe Scale Co., it is announced by Howe Executive Vice-President John G. Fenton. Pringle, 32 years old, joined Howe as assistant general sales manager July 1, 1956. By his new appointment, he is also made a member of the Howe executive committee. He had been associated for the eight years prior to this date with Sperry Products, Inc., of Danbury, Conn. Howe Scale is a division of Safety Industries, Inc. Pringle makes his home with his family in Rutland, Vt., Howe Scale headquarters. During the war, he served with the Navy as a radar technician. He attended the University of Kansas, and has also studied at Illinois Institute of Technology and Northwestern University.

• Producers Improving Equipment at Gins

ALL of the Producers' Cotton Oil Co. gins in the San Joaquin Valley will be equipped with lint combers by the start of next harvesting season, according to Ed Fischer, Producers' field manager, who spoke March 14 at the annual spring meeting of the firm's gin managers at the Fresno Hacienda.

Fischer stated that for the past two years Producers has done extensive research and experimentation with new ginning equipment, particularly with secondary lint combers.

"As a result of this research," he said, "all of Producers' cotton gins are being equipped with the latest type of lint combers best suited to each particular area. Determining factors considered in the type of equipment to be installed were grade, lint turnout, spinning qualities, and most important, the ultimate return to the growers."

Fischer stated that in order to help the cotton grower fight the cost-price squeeze, all Producers' cotton gins are equipped to assure the grower of the most efficient job of ginning and the highest possible return for his cotton crop.

Lions See Cotton Film

Bill Foreman, public relations director, and Ford Boyd, head of the visual aids department, National Cotton Council, showed a cotton film March 11 at the Memphis Lions Club.

Oil Mill Short Course Program Planned

A tentative program has been announced for the annual Oil Mill Operators' Short Course at Texas A&M College, May 7-8.

Sponsors, with the College, are Texas Cottonseed Crushers' Association and the International Oil Mill Superintendents' Association.

Dr. J. D. Lindsey, head, chemical engineering department, Texas A&M, is in charge of local arrangements.

Protein control, fire prevention, lint quality, boiler operation and other milling problems will be discussed. Panel sessions and roundtable discussions always are featured at the Short Course, which is in its twenty-sixth year.

Superintendents are invited from any state or foreign country. Detailed information is available from Texas A&M and the other sponsors.

Mill Offices Damaged

Offices of the Wesson Oil and Snowdrift Co. Mill at Columbus, Miss., were damaged recently by fire from a nearby machine shop.

Plan To Close Gin

Muskogee Cotton Oil Co. has applied to Oklahoma Corporation Commission for permission to close its gin at Claremore, Okla.

Moss-Gordin Staff Flies to Sales Meeting

MOSS-GORDIN Lint Cleaner Co. executives and salesmen are shown as they arrived by company planes for the recent sales meeting in Harlingen, Texas. Representatives from the entire Cotton Belt attended. The 1958 get-together was officially opened with address of welcome by Frank Parker, mayor of Harlingen, and Raymond Miller, Valley Ginners' Association president. The group then adjourned to Mexico for dinner at Matamoros, followed by a tour the next day of ginning plants in Mexico and the Lower Rio Grande Valley. John W. McKelvey, Taft Cotton Oil Co. president, entertained the meeting during its third day with a Gulf Coast fishing trip aboard his 90-foot yacht, and dinner.

Business sessions centered around a review of Moss-Gordin progress during the year past, and plans for product and sales advances in 1958. Jack Towery, Moss-Gordin textile engineer, discussed the more than 4,000 rigorous tests conducted to evaluate in detail the efficiency of the Moss Lint Cleaner. Fresh from a complete tour of cotton areas, President John T. Gordin reported on the enthusiastic reception of the Moss, which brought about 40 percent production increase at the firm's Lubbock plant in the past year. Expanded manufacturing facilities promise still further increases, and new products for the cotton industry are being considered. He pointed out the trend toward the use of double lint cleaning with the Moss set up in tandem.

Winners Named in Contest Sponsored by Ginners

Preston Wilson and Jimmie Lowrie won the 4-H Club Cotton Contest sponsored in 1957 by gins of Hockley County, Texas. Wilson made 7,200 pounds of lint on five irrigated acres. Lowrie grew 2,570 pounds on five unirrigated acres.

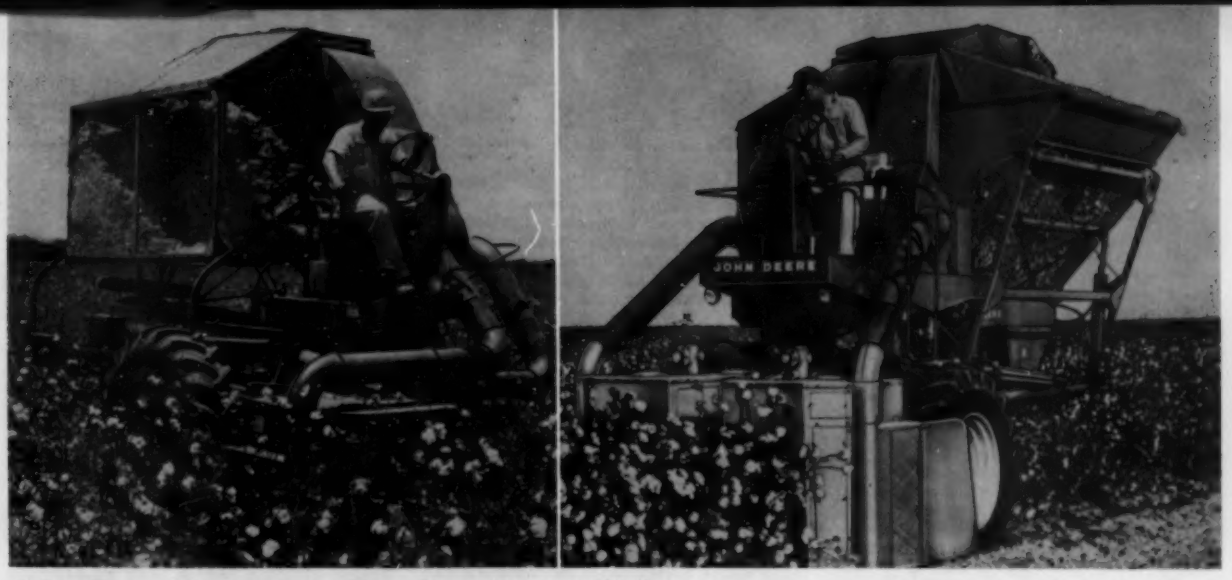
Gins cooperating in the contest were: Buster's Gin, Cooke Gin Co., Farm Center Gin, Whitharral Farmers' Co-op Gin, Heard Gin, Hockley County Gin, Hopkins Gin, J. L. Smallwood Gin, Levelland Farmers' Co-op, Locketville Gin Co., Arnett Paymaster Gin, Ropesville Paymaster Gin, Smyer Paymaster Gin, Pettit Co-op Gin, W. B. Gage Gin, Greencard Gin, Weak's Gin, Anton Gin and Ropes Farmers' Co-op Gin.

Ginners Host at Meeting

Dick Yeager, National Cotton Council; C. B. Spencer, Texas Cottonseed Crushers' Association; and Fred Elliott, Texas Extension Service, will speak March 24 at Corsicana, Texas. Navarro County Seven-Step Cotton Committee is sponsoring the meeting, with ginners hosts at a barbecue, at Navarro Junior College.

Co-op Managers Attend School

Ninety managers of cooperatives received certificates at the close of the Cooperative Managers' School at Lubbock, March 13. Wilmer Smith, president, Plains Cooperative Oil Mill, spoke at a banquet at the mill, and Roy B. Davis, general manager, was toastmaster.



John Deere Announces Two New Cotton Pickers

TWO NEW COTTON PICKERS announced by John Deere are shown here. The new John Deere 22 is on a "620" Tractor in a field near Halringen, Texas, while the new 99 Picker is shown in four-bale, skip-row cotton near Casa Grande, Ariz. The manufacturer reports that in tests all over the Cotton Belt last season, the new John Deere 22 One-Row Mounted Cotton Picker and the 99 Two-Row Self-Propelled Picker showed exceptional ability to save more cotton, and to produce equal or better grades than hand labor.

Patents have been applied for on a trash-control system including screened suction doors. The system keeps suction away from the row, so that leaf and stem particles are not sucked up and embedded in the cotton. The result is better "turnout" and higher-grading cotton.

Estes Family Honored

W. J. ESTES, Haralson, Ga., has received another honor. For the second time in history, The Progressive Farmer magazine has selected a Georgia farm family for a special agricultural leadership award. The William J. Estes family received the award for "development of community enterprises resulting in increased income for farmers in the community." Special attention was called to Estes' leadership in the Empire cotton program. Estes is first vice-president of the National Cotton Ginners' Association, received the 1956 National Ginner of the Year Award, was named Georgia Ginner of the Year in 1954 and 1955, and has received many other recognitions of his business and civic leadership. He has been mayor of Haralson, president of Georgia Cotton Ginners' Association, and is active in Rotary, the Methodist Church, the Coweta County board of education, the chamber of commerce and other organizations.

Soybeans

(Continued from Page 9)

ing depth. About one to two inches in depth is favored in most areas, unless the soil is dry. Don't plant more than three inches deep.

If planter wheels do not leave the soil firm, it may be desirable to cultipack promptly after planting.

Some specific recommendations as to planting include these:

Southeast and Midsouth — On heavy, clay soils plant about two and one-half inches deep when planting after May 1. If soil must be disked deeply to destroy winter weeds, delay planting until after a rain and plant with very shallow land preparation, placing seed in moist soil. A cultivator, mounted on the front of a tractor having a rear-mounted planter with a sweep placed over the row, aids in getting seed placed in moist soil. Excellent stands have been obtained without rain the past three years in the Delta by using a double disk opener rather than the conventional sword opener. The double disk opener permits deep placement of seed in firm, moist clay soil. A spring-tooth harrow has been used satisfactorily for shallow cultivation prior to planting with the double disk opener.

California — "It may be necessary to push dry soil aside to be certain that the seed is in good moisture and still not planted too deeply. This may be done by sowing either in the bottom of a furrow made at the time of planting, or on a bed after the dry soil is removed."

Plant 10 to 12 viable seeds per foot of row. This requires about 40 to 70 pounds of seed per acre. *Be sure to plant plenty of seed.*

Conventional row spacing of 35 to 40 inches is generally recommended. West Texas, however, says that limited experience has favored 20-inch rows on a number of farms. California says "For optimum yields and to insure shading of the soil for weed control, a row width of 20 to 30 inches is recommended. A row width should be used that will fit available cultivators and which will most nearly fit the combine which will be used for harvesting the crop."

• **Fertilization**—Properly-inoculated soybeans will produce their own nitrogen. Whether or not to supply other elements depends on local conditions, and local authorities should be consulted for fertilizer recommendations. For example, lime has been a limiting factor in soybean yields in much of the Southeast. In some other areas, fertilization of soybeans has been of limited value.

• **Cultivation**—Weed control is the major objective in cultivating soybeans in most areas, and farmers are urged not to over-cultivate the crop. Some specific comments are:

Southeast and Midsouth — "When using regular cultivating equipment, set as close to the row as possible for the first cultivation. The rotary hoe does an excellent job of destroying annual weed seedlings while beans are small. If land is heavily infested with Johnsongrass, plant small grain after soybeans are harvested, and summer fallow the next year after grain is harvested to destroy Johnsongrass."

West Texas — Cultivate as little as possible. Use the rotary hoe as long as possible, then a minimum number of plowings.

California — "If the beans are slow in coming up, cultivate with a rotary hoe or spike-tooth harrow before emergence. A similar cultivation may be given after emergence if weed seedlings are abundant. Repeat a week later, if necessary. This will usually give good weed control in solid plantings.

"With rows, one or two cultivations with regular equipment will usually be needed to control weeds. Soybeans compete well with weeds after six to eight weeks of growth. By this time the soybean plants will have covered the interrow bare area. A rotary hoe is useful early to cut out small weeds and break a crust over emerging plants. Avoid throwing too much soil around the base of the plants — small clods may be picked up by the combine, making expensive cleaning necessary.

• **Insects and Diseases** — Soybeans, as well as other crops, have diseases and insects that attack them. (A new, notable example is the soybean cyst nematode which has attacked the crop in recent years in some localities.) Neither diseases nor insects, however, have prevented the successful expansion of soybeans in the Cotton Belt. They should not discourage any producer from trying to fit soybeans into his own cropping program.

Fall army worms often seriously damage soybeans. Fields should be checked daily in July, August and into September to find if this pest is present.

• **Irrigation** — Irrigation of soybeans is essential in the West, almost essential on the Texas High Plains and often desirable in other Cotton Belt States that have 30 inches or more of rainfall. Timing of irrigation is highly important, and the experience of local growers and recommendations of local authorities should be followed. Specific recommendations for major areas follow:

Texas High Plains—Proper timing and amounts of water are the keys to successful irrigation, which is essential for soybean production on the Texas High Plains. Soybeans require an irrigation program similar to cotton, beginning with a heavy pre-planting irrigation. A general irrigation schedule for planning purposes should include one irrigation in July, another during August immediately before bloom and seed set, followed by one to three additional irrigations during seed formation and the pod development period.

Adequate late season irrigation usually increases Plains soybean yields about one-fifth. "After pods form," experienced farmers say, "keep the ground black." And, a research leader comments, "Proper late-season irrigation is considered essential by successful producers."

California — "About two to three acre

feet of water will be required on permeable loam type soils. In addition to the preirrigation, six to eight irrigations will be needed for soybeans planted in early May, and four to six for plantings made in late June. After the first irrigation, the timing should be put on a schedule of every 10 to 14 days. As soil moisture is exhausted, the leaf color of soybeans will change from a light green to a dark blue-green. Soybean yield will suffer from lack of moisture, particularly during pod formation. The last irrigation should be made when the leaves begin to turn yellow due to maturity. Less irrigation may be necessary if soybeans are grown on deep, permeable soil with the moisture raised to field capacity at planting."

• **Defoliation** — USDA says "Soybeans normally shed their leaves as they reach maturity. This is a normal maturation process with food materials being moved from the leaves to the seeds as the plants mature. Defoliation will reduce yields. Removing leaves from Ogden at 21 days prior to normal combine maturity resulted in a yield loss of nearly 30 percent. This early defoliation would have permitted combining three days earlier than normal. Removing leaves as they were beginning to yellow still resulted in a 15 percent yield loss."

• **Harvesting** — Combines do a good job of harvesting soybeans. Proper adjustment is highly important, however, or there will be a loss of beans or reduction in quality and value of the beans. Be sure that beans are not too high in moisture content when harvested.

USDA points out, "For every 35 to 40 seeds per square yard on the ground, there is a harvesting loss of one bushel per acre. Care should be taken to keep the cutter bar close enough to the ground to cut below the pods. Cutting high enough to leave five to six pods per foot of row means a loss of one bushel per acre."

Many experienced growers of soybeans caution newcomers in harvesting beans to be sure that the ground speed of the equipment is not too fast, and to reduce the cylinder speed to avoid cracking soybeans. Cylinder speeds should not exceed 350 to 500 RPM.

• **Marketing** — Unlike many new crops, soybeans are easy to sell. There are cotton oil mills throughout the South, Southwest and West anxious to buy soybeans and crush them. Farmers planning to grow soybeans for the first time will find it helpful to discuss their plans with a nearby cotton oil mill manager.

Proper harvesting of soybeans, as mentioned earlier, is essential for maximum quality and value. Beans should be sold on grade, and should have a low moisture content (12 to 14 percent) before combining starts. Growers will profit, also, by doing everything possible to keep to a minimum the amount of foreign matter in their beans.

Cotton Finishes Described

Nelson Getchell, National Cotton Council, described "New Finishes for Cotton" in an article recently appearing in the Journal of Home Economics. Published by the American Home Economics Association, the publication reaches leaders among girls and women throughout the nation.

New Yearbook

TEXAS GINNERS ISSUE ANNUAL JOURNAL

Much timely and interesting information for cotton ginners and allied industry members is found in a publication just off the press. This is the Texas Cotton Ginners' Association's "Ginners Journal Yearbook."

Ginning developments, legislation, cotton industry problems and related subjects are discussed by authors who contributed articles to the 1958 edition of the publications. Many leading firms have advertised in it.

Copies have been distributed by the Texas Association headquarters in Dallas, under the direction of Executive Vice-President Edward H. Bush.

Crutcher Moves Offices

Jack Crutcher & Co., brokers in cottonseed and soybean products, now are located at Room 330, 3340 Poplar Avenue, Memphis 11. While there is no change in this firm's operations, Crutcher now is also associated with George Seeds and Henry Hoyt, Commodity Brokerage Co.; and Ralph Thompson, Planters Sales Co.

Oil Mill Director Dies

William Richards Early, retired planter and bank president, died March 10 at Indianola, Miss. He had been a director of the oil mill at Indianola, as well as associated with other business enterprises.

Western Cotton Production

(Continued from Page 37)

just behind orifices in the boom. The result of this arrangement is that the liquid material leaving the nozzles is introduced into an air stream, which might also be described as an air screen. This air blast increases the force of the droplets and supplies some turbulence to the movement of the liquid material. It reduces the influence of wind on the evenness of application. It also, and this is most important, aligns and moves the leaves of the plant so that coverage is obtained on both under and upper sides of the leaves. With this device we are able to do eight or 12 rows of solid planted cotton at one time and with another boom, running down the blanks, we do four rows on each side of the blank. With this device, using D-2 nozzles, we now make our applications with a total of 14 to 15 gallons of water per acre.

The cost for the average farmer to own the rig would be $1.00 to $1.25 per acre, plus the average of $2.20 for material, or a total of $3.20 to $3.45 per acre. In skip row, your costs would be approximate 40 cents an acre more, or $3.60 to $4.05 per acre. We can obtain one grade better cotton through total defoliation. We know we'll have cleaner cotton. We know we are able to plan our work to get the maximum efficiency from the method of picking that we choose. We are able to use hand or machine labor, depending on the cost of each in order to use the method that would be to our best advantage.

The problems of planning are about the same as with bottom defoliation, but not quite as severe. The biggest factors still are the possibilities of wet fields from backed up tail water or from rain and, of course, the problem of getting clean water and having clean tanks. One problem is more acute with total defoliation than with bottom defoliation and that is the matter of predicting results. A field which was frequently water stressed, or had much insect damage, or which is very dry, or which has just been watered, or is too high in nitrogen level, or which is too immature, is not in good condition to defoliate. However, we have defoliated fields with a combination of two or more of the foregoing conditions existing and still had a satisfactory leaf drop.

On the other hand, the defoliation of fields which appeared in near optimum condition have occasionally been nearly complete failures. We feel that either through a different type of material, or through a better understanding of the relative importance of the unfavorable factors influencing defoliation, some better means of predicting results can be obtained.

In our own farming for this coming year, we anticipate bottom defoliation of both skip and solid plant cotton, and total defoliation on both. We might except bottom defoliation in skip row if there are indications of a dry fall.

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When Does It Pay To Machine Pick Cotton?

MARVIN HOOVER, Cotton Specialist, California Extension Service, Shafter.

There have been three important forces working in favor of the cotton grower in his efforts to use mechanical harvesting equipment profitably. These are the effectiveness of research and extension of new technology to growers, the efforts of machinery manufacturers to develop equipment adapted to varying conditions, and the success of individual farmers in improving practices and management both in producing and harvesting cotton.

As a result of acreage allotments, the farmer who has had his acreage cut almost 50 percent is not now able to operate his machine at full capacity. Furthermore, rises in prices and costs operate to aggravate the reduced acreage problem. This is because the major cost item in mechanical harvesting is the high overhead, including depreciation and other fixed costs that go on regardless of how much the grower uses the machine. In addition, there have been some increases incurred in operating costs to cover repairs, fuel, labor and other items.

Improved technology is being put into use on the farm. Probably the most important has been the dramatic increase in yields. This increase in yield represents almost a 50 percent step-up over the yield reported in 1949.

When the chips are down it is harvesting cost per bale that the farmer is watching—not cost per acre. The grower has been able to increase the number of bales per acre, as cost of harvesting an acre rose, and has been able to do so without appreciably increasing harvesting time—and cost—per acre.

• **California Studies** — To compare the changes in 1957 conditions with that of producing cotton in California in 1949, the cotton grower would have costs of $19.00 per bale for mechanical harvesting as compared with $15.000 at the earlier date. The 1957 cost would have been $27.00 per bale, however, without yield increases. These are direct costs of machine harvesting and include only overhead costs and operating expenses, but not grade losses and field losses. In 1949 the grower averaged 145 acres of cotton per farm; now, under the allotment program, cotton averages 75 acres. The average yield rose from 1.58 bales per acre to 2.3 bales per acre. The effect of the cut in cotton acres on the cost per bale, in terms of 1957 conditions, was $19.28 when an operator picks 200 acres and $35.61 when he picks only 50 acres with one machine. These costs include allowances of $9.00 for grade loss and $1.00 for field losses.

Such costs would mean a saving of $19.22 when 200 acres were harvested and only $2.89 when only 50 acres were harvested when compared with a hand-harvesting cost of $2.75. The figures indicate that, under these conditions and at 1957 prices and costs, the farmer with over 50 acres would find it to his advantage to pick cotton mechanically, rather than to hand pick at a cost of $2.50 per hundredweight. If the hand picking costs go up, the break-even point would be below 50 acres. At a cost of $2.75 per hundredweight for hand picking, the farmer would gain about $3.00 per bale by using the mechanical picker on a 50-acre crop with a 2.3 bale yield.

The relation between the number of acres picked and the picking cost per bale is only part of the story. The range in total cost per bale, under these conditions and costs, would be from $25.49 with a three-bale yield to $63.00 if the yield is only three-fourths bale per acre. The operator with a yield of 1.75 bales would save about $1.00 per bale over hand picking cost at $2.50 per hundred weight or $4.50 at $2.75 per hundred for hand picking. It would be cheaper by about $2.70 to do the picking by hand if his yield is only a bale-and-a-half (at $2.50 per hundredweight for hand picking); but he would save $0.84 if he had to pay the pickers $2.75 per hundredweight. At all yields below a bale-and-a-half, it would be cheaper to hire his cotton picked by hand than to own a machine. The range in savings per bale for

a machine operation with hand picking at $2.50 would be between $9.50 with a three-bale yield to a loss of $28.00 per bale at a three-fourths-bale yield.

It costs more to own and operate a mechanical picker than it did in 1949 and 1950. Sound technology, up-to-date know-how, and capable management are critical factors in getting profits from the mechanical picker. High yields are essential for the small operator whose acreage allotment has cut him sharply below his potential season's capacity. This operator is also under even more pressure to use his machine efficiently so as to minimize great field losses. These figures indicate that it is a little harder to get a given amount of profit out of the harvester than it was before the changes of the last seven years. Nevertheless a farmer with an acreage yield of two and one-fourth bales per acre or more, will find it to his advantage to use mechanical picker if he operates 50 acres or more of cotton.

• **Arizona Studies** — The cost of operating and maintaining a one-row cotton harvester in Arizona on a per bale and per hundredweight basis is shown as $14.17 per bale and $0.99 per hundredweight. These costs are based on picking 140 acres of two-bale cotton of which 120 acres were picked a second time. Also of interest is a breakdown of some of their costs for first and second pickings. Their cost per bale for first picking was $11.44. For second picking, it was $24.03, or an average cost of $14.16 for the two pickings.

With a field loss of 16 percent or less, the advantage lies with the machine over hand picking, provided the yield averaged two bales per acre and the machine was used on 140 acres. With a hand picking rate of $3.00 per 100 pounds seed cotton, with low yield or small farm operation, a higher field efficiency would be necessary for profitable machine use.

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Latest Developments in Ginning Upland and Long Staple Cotton

VICTOR L. STEDRONSKY, Engineer in Charge, U.S. Cotton Ginning Laboratory, Mesilla Park, N.M.

Emphasis was on cleaning for the 1957 ginning season, and many ginners discovered that they did not have adequate drying and cleaning facilities to cope with the adverse crop conditions. The stick remover has made it possible to increase the cleaning efficiency of overhead machinery. The grid bar cleaning principle employed is effective for removal of sticks, green leaf and some grass, and is more effective than the big bur machine for removal of burs and leaf trash. This principle is now incorporated in the design of seed cotton cleaners and new extractor feeders. Grid bar stick remover attachments may also now be obtained for older models of extractor feeders and big bur machines.

This year saw an increase in the use of seed cotton driers. Their effectiveness for moisture removal is well established, and many gins have two or even three stages of drying.

Other improvements include: (a) automatic bulk seed cotton feed controls (b) improved designs of moting and cleaning incorporated within the gin stands, and (c) gin stands with increased capacity.

The use of standard density gin presses is on the increase in areas where transportation to cotton mills is a problem. Several high density presses have been operating in California gins for the past two years.

The use of automatic cotton samplers seems to be on the increase. Several have been installed on the High Plains and in New Mexico this year.

There has been some progress in the control of dust, fly, lint and trash on the gin yard. The small diameter cyclones are effective in collecting trash, burs, motes and fly. However, they must be used with fans providing sufficient pressure for overcoming greater operating resistances than for conventional collectors. The new cyclones require about four inches on the water gauge. Properly sized and designed dust houses can also be used for effectively controlling fine trash, dust and fly from mote and unloading fans. The screen cage lint catchers look promising as devices for controlling lint and fly from condenser and lint cleaner exhausts.

• **Lint Cleaning** — Probably the greatest change in ginning practices this past year was in lint cleaning.

In an effort to keep abreast of these rapidly changing conditions, the Mesilla Park Ginning Laboratory included in its 1957 ginning season program, some tests with double lint cleaning. These tests were on early- and late-season machine-picked 1517C cotton from the Pecos Valley. The seed cotton drying and cleaning machinery was kept constant for all tests and three combinations of lint cleaning were employed with a check: (1) *unit* saw type lint cleaner only; (2) *bulk* saw type only; and (3) the combination of unit and bulk lint clean-

er. These three lint cleaning methods were compared to no lint cleaning, but to date, complete results from the early picking only are available.

The first harvest was picked before frost and the seed cotton came to the gin containing five percent foreign matter and 16 percent moisture. Samples taken at the feeder apron showed that moderate drying and cleaning reduced the foreign matter to 2.5 percent and the moisture to 13.5 percent. The ginned lint with no lint cleaning contained 6.3 percent foreign matter and 7.2 percent moisture and was classed as Low-Middling, 1-⅛ inch staple length. The unit saw type lint cleaner alone reduced the foreign matter in the lint to 4.9 percent and the samples classed Low Middling plus, 1-⅛ inch. The bulk saw type lint cleaner alone reduced the foreign matter from 6.3 to 3.6 percent and the samples classed Strict Low Middling, 1-5/32 inch. The unit and bulk cleaners used in tandem reduced the foreign matter in the lint to 2.5 percent, however; the classification remained Strict Low Middling, 1-5/32 inch.

• **Spinning Tests**—Cotton quality measurements including spinning tests have been or are being made on samples from all the treatments used in the tests. Nep counts in both the ginned lint and in the card web showed consistent increases with lint cleaning. The tandem combination produced twice as many neps as compared with cotton not lint cleaned. Fibrograph and Suter-Webb array data show consistent decreases in average staple length with increased lint cleaning. The array data indicated that the length decrease was accompanied by an increase in short fiber and a decrease in longer fibers. "Appearance" of the yarn spun from tandem lint cleaners was slightly lower than that from single lint cleaners.

The late-season cotton was the second picking from the same field but was made after frost; it contained 6.5 percent foreign matter and 10 percent moisture. The foreign matter in the seed cotton was reduced to two percent and the moisture content to eight percent by the same amount of drying and seed cotton cleaning as used on the first picking. The ginned lint with no lint cleaning contained 6.6 percent foreign matter and 5.0 percent moisture. The fiber was classed Low Middling, 1-1/8 inch.

The unit lint cleaner reduced the foreign matter to 4.7 percent and samples classed Strict Low Middling Minus, 1-1/8 inch. The bulk type cleaner reduced the foreign matter to 3.5 percent and samples classed Strict Low Middling, 1-1/8 inch. Tandem cleaning further reduced the foreign matter to 3.2 percent, but as in the early season, grade and staple remained the same as with the bulk unit alone. Spinning and fiber array data are not yet available, but fiber tests show nep increases similar to the early season and a trend towards shorter average staple lengths.

In general, double lint cleaning improves the grade of cotton but tends to reduce the end use values. Except for neps, there was no great difference in fiber properties and yarn appearance due to multiple lint cleaning, yet there was a trend toward a reduction in the quality of the product.

Tests made at the Mesilla Park, N.M., roller ginning laboratories showed that machine-harvested American-Egyptian cotton can be ginned satisfactorily with fair grades resulting. Consequently, the use of moderate drying, conventional cleaners, bur machine and extractor feeders are now standard equipment in the newer or remodeled roller gins in Arizona, New Mexico, and Texas. However, these machine-picked cottons do not yet grade as high as comparable hand picked varieties.

• **Roller Gins** — The low ginning capacity of roller gins is still a major cost item in the production of American-Egyptian cottons. The rotary knife gin appeared to be a big step in this direction. This development did not materialize because further research with this principle disclosed that the seed cracking which took place during ginning was difficult to overcome. In spite of all efforts, we have not been able to eliminate this condition. However, the developmental program is still being pursued vigorously. New ideas are being tried and several pilot models have been built. It is hoped that some fruitful results of this work will be found in the near future.

One good result of the rotary knife gin was the creation of a lot of interest in roller gin stand improvement. Although these efforts have not yet yielded a new and faster gin they have contributed toward greatly improving the capacity of present day roller gins. More rigid construction of rollers, spiral winding of the covering, and heavier construction of bearings allowing increased crank speeds are some of the features of the newer gins that have increased capacity.

The use of belts and an air nozzle pickup for conveying the lint to a condenser and double box presses in some of the new gins has reduced labor requirements considerably in roller ginning American-Egyptian cotton. This system also permits the use of pneumatic lint cleaners, a practice which was tried at the Mesilla Park laboratory for the first time.

The idea of pneumatic conveying of lint from the gin stands to the press by means of lint flue and suction condenser has been revived. One Arizona gin has a pneumatic system which employs an injection-type air nozzle for doffing lint from the rollers. This system is very successful and is an improvement over the old 1942 USDA lint flue system in reducing the volume of air required.

These developments have paved the way for the use of additional lint cleaning at roller gins. Several Arizona gins have done this by installing mill-type lint cleaners. In these installations the lint is picked up by air at the end of the conveyor belt and conveyed to a suction condenser and the resulting bat is fed through a mill-type Buckley Beater cleaning opener, then through a pneumatic lint cleaner, and then through another opener and lint cleaner on its way to a condenser and double box press. ◆ ◆

CALENDAR

CONVENTIONS MEETINGS.. EVENTS...

• April 10-11 — Cotton Merchandising Research Clinic. Commodore Perry Hotel, Austin, Texas. For information write Joel F. Hembree, P. O. Box 8020, University Station, Austin.

• April 13-15 — Texas Cotton Ginners' Association annual convention. State Fair of Texas grounds, Dallas. Edward H. Bush, executive vice-president, Dallas. For exhibit information, write Edward H. Bush, president, Gin Machinery and Supply Association, P. O. Box 7665, Dallas 26.

• April 13 — National Cotton Ginners' Association annual meeting, Dallas, Texas. Tom Murray, P. O. Box 1098, Decatur, Ga., executive secretary.

• April 14-15—Valley Oilseed Processors' annual convention. Buena Vista Hotel, Biloxi, Miss. C. E. Garner, 416 Exchange Building, Memphis, secretary.

• April 21-23—American Oil Chemists' Society spring meeting. Memphis. For information, write AOCS headquarters, 35 East Wacker Drive, Chicago.

• May 5-6 — National Cottonseed Products Association annual convention. Atlanta Biltmore Hotel, Atlanta. John F. Moloney, 43 North Cleveland, Memphis, secretary-treasurer.

• May 6-7—National Cotton Compress and Warehouse Association, annual meeting, Sheraton Palace Hotel, San Francisco, Calif. Additional information may be obtained from John H. Todd, 1085 Shrine Building, Memphis 3, Tenn.

• May 7-8 — Oil Mill Operators' Short Course. Texas A&M College, College Station. Sponsored by A&M, Texas Cottonseed Crushers' Association and International Oil Mill Superintendents' Association. Write Dr. J. D. Lindsey, Texas A&M, for information.

• May 16-17—Texas Cotton Ginners' Association directors and allied industry meeting. Dallas, Texas. Edward H. Bush, P. O. Box 7665, Dallas, executive vice-president.

• May 19-20 — Oklahoma Cottonseed Crushers' Association annual convention. Quartz Mountain Lodge, Lake Altus. Edgar L. McVicker, 307 Bettes Building, Oklahoma City, secretary.

• June 1-3—Texas Cottonseed Crushers' Association annual convention. Hotel Galvez, Galveston. Jack Whetstone, 624 Wilson Bldg., Dallas, secretary-treasurer.

• June 4-6—Tri-States Oil Mill Superintendents' Association annual convention. Edgewater Gulf Hotel, Edgewater Park, Miss. B. C. Lundy, Greenville, Miss., and Woodson Campbell, Hollandale, Miss., co-chairmen.

• June 5-7—American Cotton Congress at Harlingen, Texas, and Matamoros, Mexico. For hotel or motel reservation write: Harry Nunn, Madison Hotel, Harlingen. For general information write to Burris C. Jackson, Hillsboro, Texas.

• June 8-10—International Oil Mill Superintendents' Association annual convention. Baker Hotel, Dallas. H. E. Wilson, P. O. Box 1180, Wharton, Texas, secretary-treasurer.

• June 11-13 — Mississippi Cottonseed Crushers' Association annual convention. Buena Vista Hotel, Biloxi. Gordon Marks, 890 Milner Building, Jackson, Miss., secretary.

• June 23-24 — Joint Convention, North Carolina, South Carolina and Southeastern Cottonseed Crushers' Associations. Ocean Forest Hotel, Myrtle Beach, S.C. For information, write Mrs. M. U. Hogue, 612 Lawyers' Building, Raleigh, N.C.; C. M. Scales, 318 Grande Theatre Building, Atlanta; or South Carolina Association, P. O. Box 514, Columbia, S.C.

• June 25-27 — Southwestern Peanut Shellers' Association annual convention. Lake Texoma Lodge, Kingston, Okla. John Haskins, Durant, Okla., secretary.

• June 26-27—New Mexico Cotton Ginners' Association annual convention. Navajo Lodge, Ruidoso, N.M. Carl Meriwether, P. O. Box 232, Las Cruces, N.M., secretary.

• Aug. 12-14—Beltwide Cotton Mechanization Conference. Memorial Center, Brownsville, Texas. For information, write National Cotton Council, P. O. Box 9905, Memphis, Tenn.

• Oct. 20-22—American Oil Chemists' Society fall meeting. Chicago. For information, write AOCS headquarters, 35 East Wacker Drive, Chicago.

• Dec. 17-18—Beltwide Cotton Production Conference. Rice Hotel, Houston, Texas. For information, write National Cotton Council, P. O. Box 9905, Memphis 12, Tenn.

Keeps Up with Friends

J. E. Moses, retired secretary-treasurer of Georgia Cottonseed Crushers' Association and before that National Cottonseed Products Association field representative, keeps up his interest in the industry. His health is good and he enjoys visits with friends at his home, 770 Myrtle, N.E., Atlanta.

Helps Plan Feeders' Day

Kenneth O. Lewis, Lubbock, NCPA field representative, recently visited many West Texas oil mill managers to help Texas Tech and Texas Cottonseed Crushers' Association plan the annual feeders' day at Tech.

laugh it off

The wife sulked, feeling insulted.

"No, I did not say you were built like a truck," soothed the husband. "I merely observed that people are afraid to pass you on the right."

• • •

Sam got a dollar too much in his pay envelope one week, but did not say anything. The next week the paymaster discovered the error and deducted a dollar.

"Say," Sam said, "I'm a dollar short."

"Well," said the paymaster, "you didn't complain last week when you were a dollar over."

"Yes, but a guy can overlook one mistake. When it happens a second time, it's time to complain."

• • •

At a country fair a man was demonstrating how a "new" type of electric egg boiler turned out a perfect three-minute egg.

When the demonstration was concluded, a little grayhaired lady timidly inquired, "Excuse me, but did I understand you to say that each minute you want the egg to boil you put in just one teaspoon of water?"

The demonstrator assured her this was correct.

"I see," said the little lady; "now is that level or heaping?"

• • •

At a dinner party, Jones was so shy and nervous that he couldn't talk to anyone. All evening long, he had been trying to think of something nice to say to the hostess.

At last, seeking to draw him out, the hostess remarked, "What a small appetite you have, Mr. Jones."

"To sit next to you," said Jones, gallantly, "would cause any man to lose his appetite."

• • •

"I suppose after you get out of the service you'll be waiting for me to die so you can spit on my grave," barked the old sergeant.

"Oh, no," replied the draftee. "After I get out of this uniform I won't want to stand in line again!"

• • •

Two old mountaineers, sitting on a cabin porch, were examining an ancient armspiece.

"Good shot gun that," said the owner, patting the rusty relic. "It's killed possum, coon, wild turkey, and squirrels. What's more," he added under his breath, "it got me two sons-in-law."

• • •

Judy Canova confesses: "My mother told me so much about the birds and the bees I had a terrible time getting interested in men!"

• • •

A meek little man in a restaurant timidly touched the arm of a man putting on an overcoat. "Excuse me," he said, "but do you happen to be Mr. Smith of Newport?"

"No, I'm not!" the man answered impatiently.

"Oh—er—well," stammered the first man, "you see, I am, and that's his overcoat you're putting on."

• • •

They say woman's work is never done —especially if she's asked her husband to do it.

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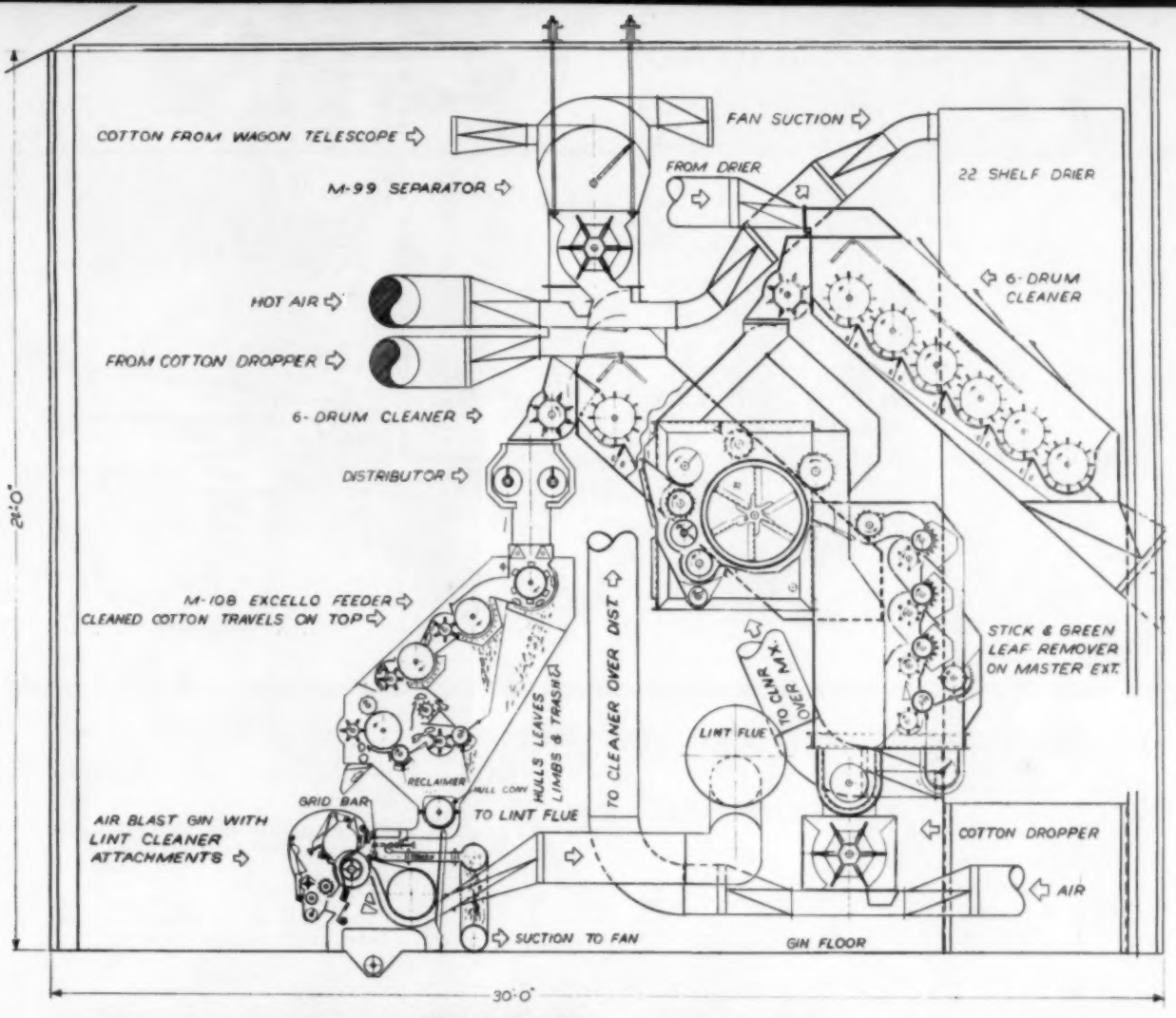

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